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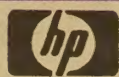
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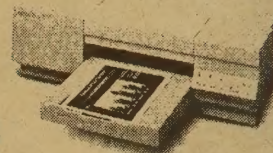
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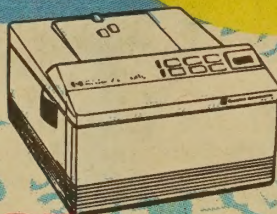


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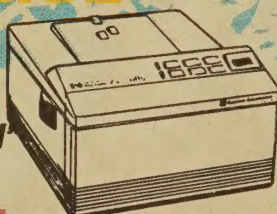


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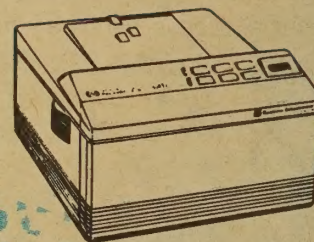
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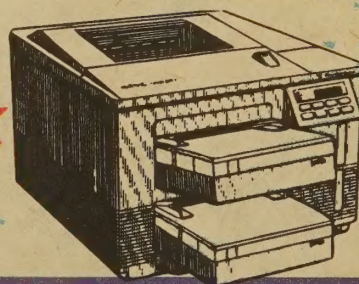
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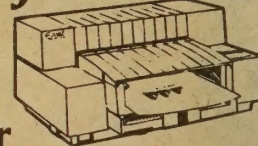
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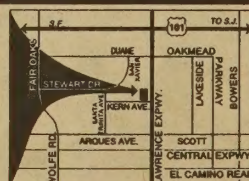
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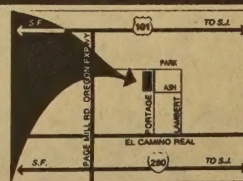
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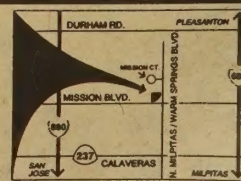
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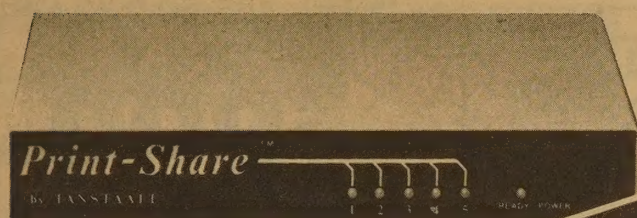
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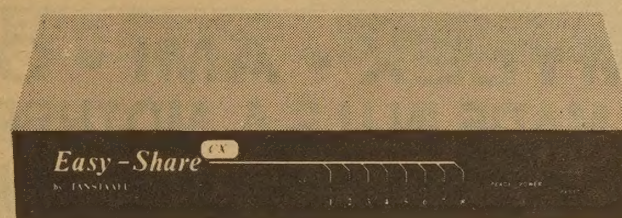
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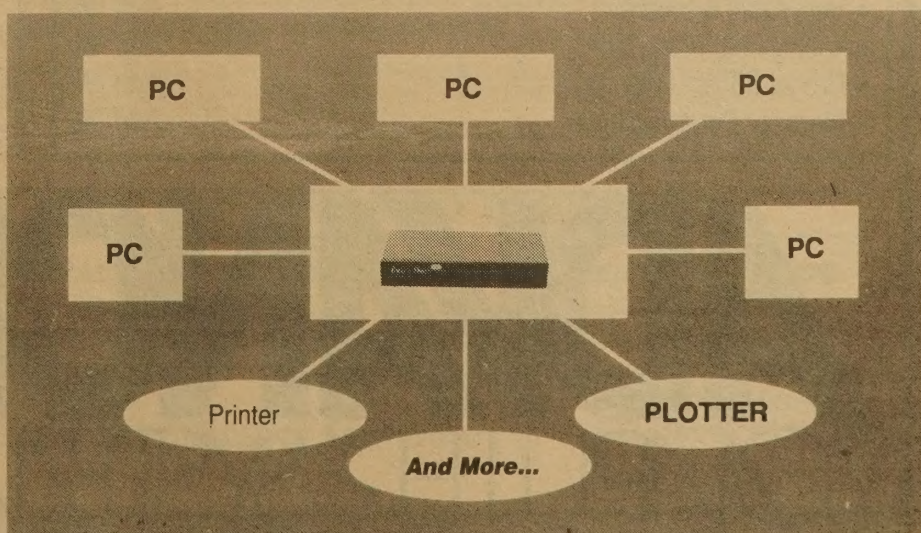
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A NOTE FROM THE EDITORS

By the time you read this, we'll already be caught up in the events of 1993, which, if 1992 is any indication, will be far from boring. (Indeed, as we're going to press, word is that Novell is buying UNIX from AT&T, which should liven up the OS wars...)

This issue features our traditional *MicroTimes* 100 list of people—*Fortune* 500 executives, fledgling entrepreneurs, programmers, writers, volunteers, and more—whose activities during the year helped shape the microcomputer industry and the community of users and service providers that surrounds it. We'd like to thank our readers for their valued input in helping us compile this list, and, as always, solicit your suggestions for next year's version.

We hope the year's off to a good start for all of you, and we're looking forward to the continued opportunity to bring you useful information in 1993.

—ME

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COVER STORY

The Sixth Annual Microtimes 100

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It's probably no surprise that Bill Gates of Microsoft and Andy Grove of Intel top this year's list of industry leaders—during 1992, they led their companies to even more spectacular success in the marketplace and, seemingly, an assured position of continued dominance in the world of emerging standards.

But 1992 was a year of future-creation, alliance-building, and advances in formerly esoteric technologies from encryption to virtual reality, and many other people, famous and obscure, had a significant impact on the rapidly changing state of personal computing. We hope you find this year's overview informative.

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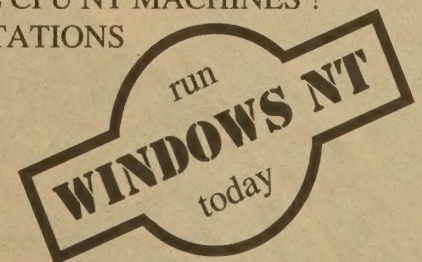
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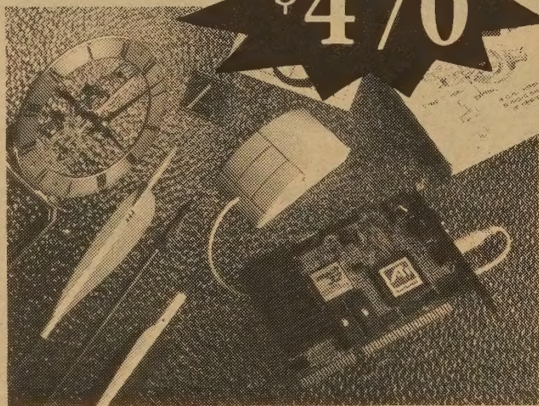
By Douglas J. Nakakihara

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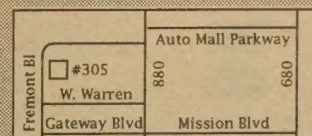
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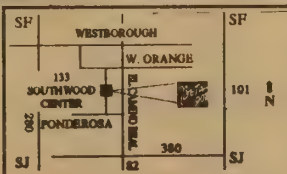
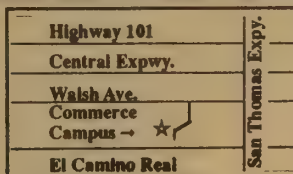
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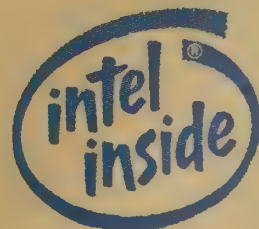


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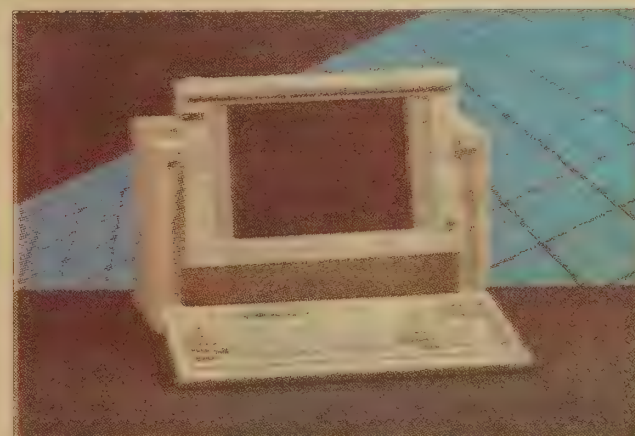
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INDUSTRY INSIGHT

Key Players Formalize Video Standards Novell Considers Lawsuit Against Microsoft

BY PAUL
HOFFMAN

GETTING IT ON YOUR SCREEN: VIDEO BECOMES MORE REAL

The software side of the video-on-your-PC has now been formalized by the major three players in the operating system business, but don't expect the *I Love Lucy* reruns to appear

Microsoft's entry, Video for Windows, runs as an OLE server so that all major Windows programs that have OLE capabilities can control the videos. For example, Word for Windows or Ami Pro can start a video running when you click on a particular part of a word

processing document. Other programs might capture video frames from a video you are viewing to incorporate in their documents.

Apple made a bigger splash in the established multimedia community with its announcement of the long-

awaited QuickTime for Windows. Since QuickTime for the Macintosh has been available for over a year, many developers have already created hundreds of movies. The movie formats for the PC and Mac are identical, so movies can be run on either without conversion. However, Apple did not make QuickTime work with OLE, limiting its attractiveness to the established Windows developer market. Apple has said that it will include OLE support and bigger windows within the next few months.

IBM, as expected, announced that its video offering will run only under OS/2. Since OS/2 is a multitasking operating system, you can watch many video clips simultaneously and still work in a different program, which might be useful in some business scenarios. However, IBM did not formally release the product; instead, it announced the beta-test version and said the full version would ship sometime in 1993.

All three systems have similar drawbacks, the two biggest being the size of the video files and the lack of interesting material. Even small videos take up dozens of megabytes on disk. For instance, QuickTime videos take up 4MB for every minute of video. This pretty much restricts video distribution to CD-ROMs, which still have not penetrated the market to any great extent. Even when distributed on CD-ROMs, however, the movies show up as a small patch on your screen about the size of a 3 x 5 card, giving the impression that all that disk space isn't really going for much. Also, the compression scheme used to store videos in all three formats is not that fast, so unless you have a fast CD-ROM player, the videos can appear jerky.

The biggest problem is the lack of interesting material. Even with good software and hardware, what is it that you really want to watch on your computer? Certainly not standard TV entertainment, since televisions give significantly higher quality. Some game software could easily benefit from added videos, but that is not a significant market, particularly if you require the user to have a CD-ROM player. To date, there is almost no business necessity for video. Sure, it might be fun to see someone's face as you hear them talking, but is that really worth all the overhead of a CD-ROM?

Of the three new video software toolkits, Microsoft's will probably become the leader within the year. Apple's lead with QuickTime will certainly make it a force to be reckoned with, but by no means assures Apple of long-term dominance. Microsoft has promised that Video for Windows movies will play well on the Macintosh, so neither company has any advantage there. IBM could be a wildcard: if the only real market for video is high-quality professional systems, users may opt for OS/2

The biggest problem is the lack of interesting material. Even with good software and hardware, what is it that you really want to watch on your computer?

any time soon. Apple, Microsoft, and IBM have recently announced the system software needed for other developers to display television-quality movies on the PC in standard formats. Each company's software is incompatible with the others', and offers different levels of integration. None offers anything near real television quality on anything but the fastest PCs.

The industry calls it "desktop video," a subset of multimedia. In the simplest case, you should be able to view, on your PC, a PC-compatible video sent to you by someone else, and hear the sound with it. The next step up would be the ability to stop the video, go backwards and forwards frame by frame, and copy individual frames or sequences of frames to other PC applications. The next advance is the ability to edit videos: mixing sources, adding titles, and stripping on sounds. Given that we live in the MTV age, adding special effects should also be easy.



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NOVELL CODE IN WINDOWS FOR WORKGROUPS

In a move that could seriously blunt the sales of Windows for Workgroups, Novell has accused Microsoft of shipping Novell's code, originally supplied for Windows 3.1, with the new Windows for Workgroups software. Novell is extremely upset at Microsoft's ac-

tion, of which it was unaware, because Windows for Workgroups directly competes with both NetWare and NetWare Lite. Microsoft apparently did not discuss the code inclusion with Novell before the Windows for Workgroups announcement, to the point of taking Novell off of the beta test list so the networking company might not find out about the code use before the product was released. The two companies are negotiating, but Novell has indicated that it takes the matter very seriously.

Novell has raised the stakes in its fight with Microsoft by publicly looking for partners in a potential antitrust suit against Microsoft.

Novell is not known for being litigious, particularly compared to Microsoft, but it has said that it will take the issue to court if it is not resolved soon. According to Novell, the code supplied in the agreement was for Windows standalone software only, not for Windows bundled with additional networking software. In the past, Microsoft has been known to fudge the definition of what is and is not a version of software, and is apparently trying to say in this case that Windows for Workgroups is a version of Windows 3.1, even though all of its marketing says the opposite.

It is unclear why Microsoft took the tactic it did, given that Windows for Workgroups really only needs minimal NetWare connectivity to be attractive. The vast majority of Windows for Workgroups sales will be to users who are not on a Novell network and instead want a simple peer-to-peer connection. Companies that have already standardized on NetWare are unlikely to be interested in letting groups use Windows for Workgroups even if it is a better product. Thus, having simple NetWare interactivity (instead of full-blown core protocol compatibility) would suffice for almost all potential Windows for Workgroup customers.

Novell is understandably upset about Windows for Workgroups. From early reports, networks based on Windows for Workgroups are much easier to install and maintain than those based on NetWare Lite. Novell is planning to bundle NetWare Lite with its DR DOS operating system early next year, selling manufacturers a single-source package of networking and operating system. Hinted improvements to DR DOS will make it much more attractive than MS-DOS if Novell could just get its foot in the door of corporations.

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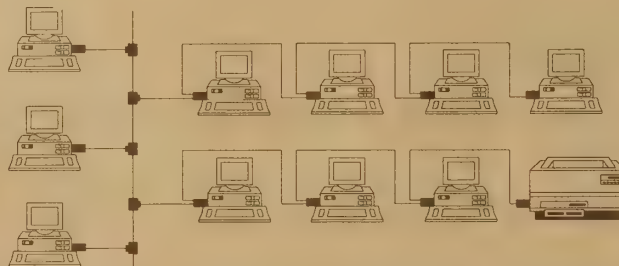
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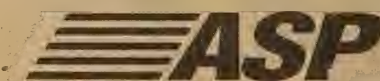
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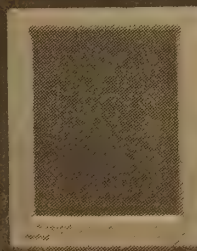
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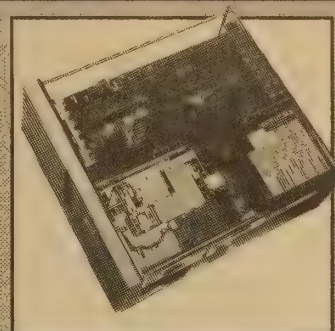
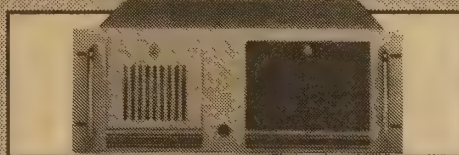
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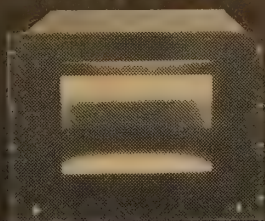
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- 386DXC-33\$640
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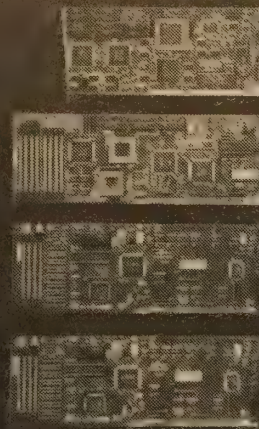
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Windows for Workgroups pretty much prevents that, in that it is a viable (if not downright attractive) peer-to-peer solution that even comes with Windows. The combined package may turn into Novell's only client software, greatly simplifying future Novell installations.

Microsoft may have goofed on another front. Novell says that, because Microsoft used the Novell connection code in Windows for Workgroups without notifying Novell, there are many incompatibilities in the product. They claim that some drivers, utilities, and backup don't work reliably with the way that Microsoft included the code. This, of course, irks Novell, since many users may blame the incompatibilities on them, not Microsoft. It will also cause a headache for Novell's technical support staff, who can only refer the problems to Microsoft and hope that their customers believe them.

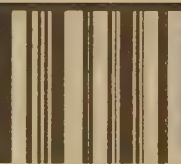
Novell has raised the stakes in its fight with Microsoft by publicly looking for partners in a potential antitrust suit against Microsoft. This comes on the heels of the Federal Trade Commission's drawn-out investigation of Microsoft for possible prosecution under antitrust laws. The rumor mill has been rife with speculation that the FTC is almost ready

Hinted improvements to DR DOS will make it much more attractive than MS-DOS if Novell could just get its foot in the door of corporations.

to make a finding, but seasoned FTC watchers know that predicting the timing of the commission is virtually impossible. Novell does not need to wait for the FTC's findings to press a suit, however. If Novell can convince others that Microsoft's actions are more than just predatory, the facts that come out in the lawsuit could seriously hurt Microsoft's reputation. Even if Novell goes against Microsoft alone, the repercussions could be significant for both companies.

Not that Novell is without problems it caused all by itself. Earlier this year, some students in the Netherlands discovered a

major security hole in NetWare that allowed a regular user to piggy-back on a different user's connection and obtain confidential data from a server. Novell released a patch a few months ago, but it turns out that that patch didn't solve the problem. A second patch was issued that apparently fixes the security hole, but at the cost of a significant degradation to the speed of the network. Novell claims that the degradation could be as much as 10%, but others say that it could easily be 40%, and that even small networks can see more than a 10% speed decrease using the patch. ■



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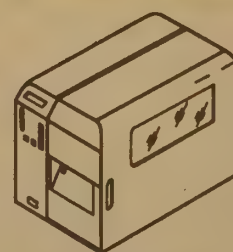
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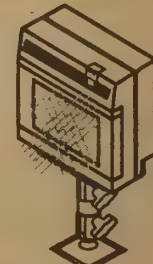
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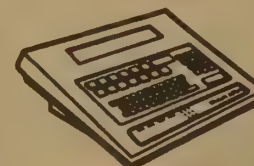
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The box score for our index of thirty-two high-tech concerns last month read as follows: up 289.8 points, or a hefty 8.2%. The Microtimes Stock Index was in good company as the S&P 500 (up 4.96% to 434.64), the NYSE Composite (up 4.89% to 238.97) and the NASDAQ Composite Index (up 10.32% to 658.93) all rose to record levels.

The reason behind last month's powerful rally: investors rushed to embrace technology stocks, believing these volatile issues will be among the best performers in a bull market. So far, these issues have been leading the market to higher ground, with no end in sight at the time of this writing.

Among the technology stocks enjoying the fruits of last month's rally:

LSI Logic topped the leaderboard with a resounding 55.4% rally en route to a new high of \$10.88. Last month, the company said it sees solid profitability in the fourth quarter prompting LSI to cancel its planned holiday shutdown.

AT&T's stock advanced \$5.38 a share, or 12.5%, before settling in at a new high of \$48.50. At the time of this report, the telephone and computer giant was negotiating to buy a 33% stake in wireless phone giant McCaw Cellular Communications for \$3.73 billion and consequently acquire an option for voting control. Specifically, the company plans to purchase 47 million shares of McCaw Cellular for \$42 a share. The transaction would put AT&T in direct competition with the regional Bell companies for the first time since the 1984 breakup of the Bell system.

In Canada, Northern Telecom rallied 23% to close at \$42.13 a share. Merrill Lynch raised its rating on the stock to "above average" from "neutral" after the company unveiled its first fully featured wireless business system, which is expected to improve the company's earnings in 1993.

On the sell side of the ledger, no stock fell further last month than Borland. The reasons: the company's third-quarter revenues are projected to be flat with year-ago results, which in turn forced many Wall Street firms to lower their rating on the stock to "neutral" from "buy." The result: Borland was the largest dollar and percentage-loser for the trading period, as it cascaded \$11.25 a share, or 35.2%, to a new 52-week low of \$20.75. ■

EXCH	COMPANY	TICKER SYMBOL	CLOSING PRICE 10/23/92	CLOSING PRICE 12/10/92	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
SOFTWARE											
OTC	Adobe	ADBE	30.50	32.00	1.50	4.92	15	0.32	1.00	68.50	25.25
OTC	Aldus	ALDC	14.50	14.25	-0.25	-1.72	23	0.00	0.00	44.25	10.25
OTC	Autodesk	(H) ACAD	51.00	46.75	-4.25	-8.33	28	0.48	1.03	56.50	23.25
OTC	Borland	(L) BORL	32.00	20.75	-11.25	-35.16	-	0.00	0.00	86.75	20.75
OTC	Informix	(H) IFMX	27.38	33.50	6.13	22.37	25	0.00	0.00	33.50	5.88
OTC	Lotus	LOTS	19.25	20.50	1.25	6.49	12	0.00	0.00	38.75	14.75
OTC	Microsoft	(H) MSFT	88.63	89.00	0.38	0.42	34	0.00	0.00	95.00	65.50
OTC	Novell	(H) NOVL	31.00	30.75	-0.25	-0.81	40	0.00	0.00	33.50	22.50
OTC	Oracle	(H) ORCL	23.13	22.88	-0.25	-1.08	47	0.00	0.00	24.75	12.00
OTC	Software Publishing	SPCO	8.38	9.00	0.63	7.48	-	0.00	0.00	26.25	6.75
OTC	Symantec	SYMC	11.75	14.00	2.25	19.15	52	0.00	0.00	51.00	5.88
HARDWARE											
OTC	Apple	(L) AAPL	48.75	57.25	8.50	17.44	13	0.48	0.84	70.00	41.50
OTC	AST Research	ASTA	18.50	19.63	1.13	6.08	10	0.00	0.00	24.50	11.25
NYS	Commodore	CBU	7.38	7.88	0.50	6.78	113	0.00	0.00	19.25	6.75
NYS	Compaq	(H) CPQ	38.63	43.00	4.38	11.33	19	0.00	0.00	43.13	22.25
NYS	Digital Equipment	(L) DEC	33.88	33.50	-0.38	-1.11	-	0.00	0.00	65.50	31.50
OTC	Dell	(H) DELL	34.63	41.00	6.38	18.41	18	0.00	0.00	41.00	15.00
NYS	Hewlett-Packard	HWP	55.13	66.63	11.50	20.86	19	0.80	1.20	85.00	47.63
NYS	IBM	(L) IBM	69.13	61.75	-7.38	-10.67	-	4.84	7.84	100.38	60.88
NYS	Silicon Graphics	SGI	23.63	26.50	2.88	12.17	-	0.00	0.00	29.75	14.13
OTC	Sun Microsystems	(H) SUNW	32.00	33.25	1.25	3.91	22	0.00	0.00	36.13	20.75
NYS	Xerox	XRX	77.25	77.88	0.63	0.81	18	3.00	3.85	82.25	60.88
NYS	Tandy	TAN	26.75	29.88	3.13	11.88	14	0.60	2.01	31.25	22.25
CPU'S											
NYS	Advanced Micro Devices	AMD	14.38	16.88	2.50	17.39	6	0.00	0.00	21.50	7.38
OTC	Intel	(H) INTC	67.00	80.50	13.50	20.15	21	0.40	0.50	80.50	41.25
NYS	LSI Logic	(H) LSI	7.00	10.88	3.88	55.36	-	0.00	0.00	10.88	4.88
NYS	Motorola	(H) MOT	95.25	103.00	7.75	8.14	26	0.76	0.74	104.38	58.00
COMMUNICATIONS											
NYS	AT&T	(H) T	43.13	48.50	5.38	12.48	19	1.32	2.72	48.50	36.63
NYS	BellSouth Corp.	BLS	51.13	50.13	-1.00	-1.98	15	2.76	5.51	55.50	43.38
OTC	MCI	(H) MCIC	36.25	37.88	1.63	4.48	18	0.10	0.28	38.50	26.75
NYS	Northern Telecom	NT	34.25	42.13	7.88	22.99	21	0.36	0.85	49.25	30.50
NYS	Pacific Telesis	PAC	40.13	44.88	4.75	11.84	17	2.16	4.81	45.00	36.88

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

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ADVANCES.....	24
DECLINES.....	8
UNCHANGED.....	0
NEW HIGHS.....	13
NEW LOWS.....	4

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LARGEST DOLLAR LOSER.....	Borland.....	\$	-11.25
LARGEST PERCENTAGE GAINER.....	LSI Logic.....		55.36 %
LARGEST PERCENTAGE LOSER.....	Borland.....		-35.16 %

	CLOSE 10/23/92	CLOSE 12/10/92	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH
MICROTIMES STOCK INDEX	3536.03	3825.83	289.80	8.20
DOW JONES INDUSTRIAL AVERAGE	3207.64	3312.19	104.55	3.26
STANDARD & POOR'S 500 STOCK INDE	414.10	434.64	20.54	4.96
N.Y.S.E. COMPOSITE	227.83	238.97	11.14	4.89
NASDAQ COMPOSITE	597.30	658.93	61.63	10.32

CLOSING QUOTES FOR GRAPH:		
DATE	MICRO TIMES	DOW JONES
05/08/92	3642.36	3389.41
06/05/92	3562.74	3398.69
07/02/92	3182.43	3330.29
07/31/92	3367.19	3393.78
08/28/92	3198.48	3267.61
09/25/92	3313.28	3250.32
10/23/92	3536.03	3207.64
12/10/92	3825.83	3312.19

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Basic System Includes: Motherboard & CPU, 2HD/2FD IDE Controller with 2S/1P/1G, 1MB RAM, 1.2MB Floppy Drive, Mini-Tower Chassis with 200W Power Supply, 101-Key Enhanced Keyboard.

SYSTEM CONFIGURATION	286 20MHz	386SX 16MHz	386SX 25MHz	386SX 33MHz	386DX 33MHz w/128K	386DX 40MHz w/128K	486SX 25MHz w/128K	486DX 33MHz w/128K	486DX/2 50MHz w/128K	486DX 50MHz w/128K	486DX/2 66MHz w/128K
Basic System	\$259	\$282	\$295	\$297	\$370	\$396	\$408	\$660	\$732	\$847	\$874
Basic System w/42MB HD, 256K VGA Card & 0.39 Monitor	\$633	\$656	\$669	\$671	\$744	\$770	\$782	\$1034	\$1106	\$1221	\$1248
Basic System w/42MB HD, 512K SVGA Card & 0.39 Monitor	\$644	\$667	\$680	\$682	\$755	\$781	\$793	\$1045	\$1117	\$1232	\$1259
Basic System w/85MB HD, 512K SVGA Card & 0.39 Monitor	\$684	\$708	\$721	\$723	\$795	\$822	\$833	\$1085	\$1158	\$1272	\$1299
Basic System w/130MB HD, 512K SVGA Card & 0.39 Monitor	\$747	\$770	\$783	\$785	\$858	\$884	\$896	\$1148	\$1220	\$1335	\$1362
Basic System w/4MB RAM, 130MB HD, 1.2&1.44FD, 512K SVGA & 0.39 Monitor	\$873	\$896	\$910	\$912	\$984	\$1011	\$1022	\$1274	\$1346	\$1461	\$1488
Basic System w/4MB RAM, 213MB HD, 1.2&1.44FD, 512K SVGA & 0.39 Monitor	\$952	\$975	\$988	\$990	\$1063	\$1089	\$1101	\$1353	\$1425	\$1540	\$1567
Basic System w/8MB RAM, 213MB HD, 1.2&1.44FD, 512K SVGA & 0.39 Monitor	\$1069	\$1092	\$1106	\$1108	\$1180	\$1207	\$1218	\$1470	\$1542	\$1657	\$1684
Basic System w/8MB RAM, 340MB HD, 1.2&1.44FD, 512K SVGA & 0.39 Monitor	\$1367	\$1390	\$1404	\$1406	\$1478	\$1505	\$1516	\$1768	\$1840	\$1955	\$1982

VESA LocalPower Station

- 486 AIR ISA VESA LocalBus 256K Cache Motherboard 3 Slot
- 8MB 70ns RAM
- 1.2M & 1.44M Floppy Drives
- 213MB Western Digital Harddisk 64K Cache
- VESA LocalBus Orchid 32Bit IDE Controller (Up to 8MB per Second)
- VESA LocalBus Tseng ET4000 1280x1024 16.7M Color 72Hz
- 14" 1024X768NI Monitor
- AT I/O 2S/1P/1G
- Pre. Mini Tower 200W PS UL
- 101 KeyTronic Keyboard

486-33DX \$1862
486-50DX \$1947
486-66DX/2 \$2076

Add \$289 for EISA VESA LB Motherboard.

242II TrueColor Cached Station

- 486 ISA Motherboard with 128K Cache
- 4MB 70ns RAM
- 1.2M & 1.44M Floppy Drives
- 130MB Maxtor Harddisk 64K Cache
- 1MB Cached Controller (Supports 2.88MB, 4FD, Up to 64MB)
- SpeedStar 24X 1280x1024 24Bit 16.7M Color
- 14" 1024X768NI Monitor
- AT I/O 2S/1P/1G
- Pre. Desktop 200W PS UL
- 101 KeyTronic Keyboard

486-33DX \$1716
486-50DX \$1788
486-50DX \$1903
486-66DX2 \$1930

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Reminder: It makes no sense to buy a LocalBus System with LocalBus Motherboard and 16bit peripherals you aren't making use of the board. And don't ever fool around with non-VESA LocalBus Standard because compatibility will be a big issue.

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877MB SCSI 12MS.....\$1220	1.5GB SCSI 13MS.....\$1820
150MB ESDI 23MS.....\$520	Conner
Seagate	42MB IDE 15MS.....\$160
106MB IDE 15MS.....\$240	85MB IDE 19MS.....\$210
130MB IDE 16MS.....\$270	120MB IDE 19MS.....\$270
663MB SCSI 15MS.....\$1100	213MB IDE 16MS.....\$400
	213MB SCSI 16MS.....\$470
	540MB IDE 12MS.....\$920

Components/Upgrade

Motherboard without CPU: (Call for CPU Prices)

486 ISA 128K Cache (25/33/50MHz-SX/DX/DX2).....	\$149
486 EISA 256K Cache (33/50MHz).....	\$354/372
486 AIR ISA VESA LB 256K 3 VLB Slot(33/50MHz).....	\$236/249
486 AIR EISA VESA LocalBus 256K 3 VLB Slot	
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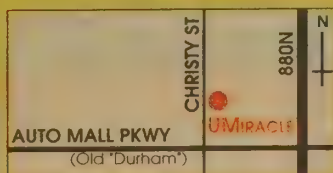
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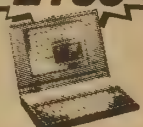
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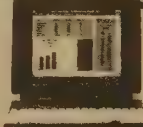
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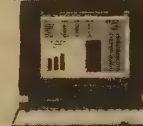
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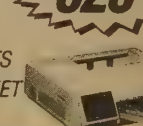
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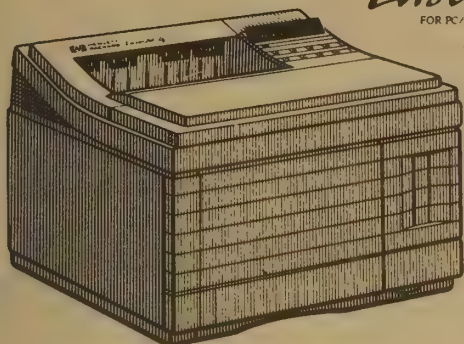
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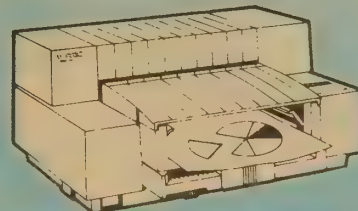
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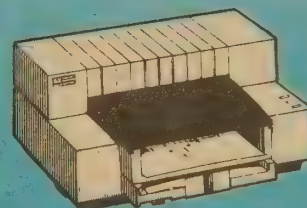
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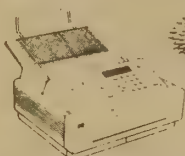


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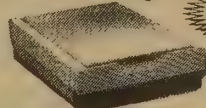
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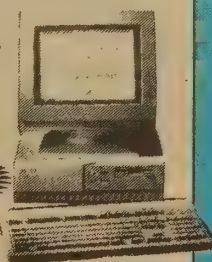
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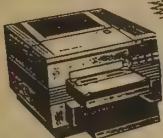
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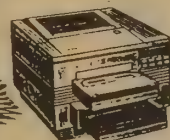
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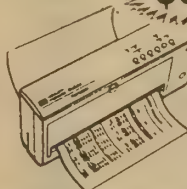
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Care And Feeding Of Car-Jackers, And More

This Column Concerns What Isn't, But Could Be—And Vice Versa

BY JIM
WARREN

REALIZABLE FANTASIES

In late September 1991, we detailed how to design theft-proof, keyless automobiles. Basically, we suggested having the engine computer query an n-character switch on the driver's dashboard for a driver-defined, driver-changeable numeric (or alphabetic) code

before it would run the engine. Well, Detroit—we're still waiting. Or are you gonna let Japan beat you to this one, too?

Or, techno-entrepreneurs could offer this as an aftermarket add-on for the decade or so it will take for Detroit to wheeze forward.

But that article was written before the new car-jacking rage. For those still blissfully ignorant, car-jackers are thieves who approach a driver at a stop light or parking lot and take their car and wallet/purse at gunpoint or knifepoint. (Of course, thieves only use registered guns and only use them in jurisdictions that have not banned guns.) For car-jackers, our design needs updating (prompted by a conversation with John Nagle of Menlo Park).

We hear that some cars—maybe some Ferraris?—now have a parking-attendant mode. When the driver enables it, the engine computer won't run over 20 mph nor travel more than one mile.

So let's put a car-jacker button or two in appropriate locations—say, adjacent to the door handle and as an out-of-the-way foot switch on the floor. Press the button and the engine computer initiates car-jacker mode: It runs normally for one mile, so the armed thieves can get well out of range of the driver they ejected. Then—unless the driver has keyed in a cancel code—the computer locks the doors, rolls up the windows, uniformly decelerates to a stop, squishes the seats to their maximum “up” and “forward” positions, turns the engine off, continuously honks the horn, blinks the lights and screams, “Help! I've been car-jacked! Call the police!” over a loudspeaker mounted under the hood—synthesized speech in one or several driver-selectable languages.

In addition, I sort of like the idea of exploding teargas cartridges inside the car and perhaps activating surgical shears in the seats, but making life-threatening felons uncomfortable would probably be grounds for multimillion-dollar litigation in California.

TRACKING THE WILY 'JACKER

It is a central, essential design characteristic of cellular-phone systems that they continuously track the approximate location of every cellular phone that is turned on. That's how they switch the call from one cell to the next as one cell's reception weakens while the next cell's reception strengthens. (Such switching is very inconvenient for the thousands of nosyvolks who use radio scanners to—illegally—eavesdrop on cellular conversations, but that's a different story.) This technically essential tracking feature offers potential danger and potential benefit.

Some years ago, Les Earnest, a pseudo-retired multi-decade AI

Press the button and the engine computer initiates car-jacker mode: It runs normally for one mile, so the armed thieves can get well out of range of the driver they ejected. Then the computer locks the doors, rolls up the windows uniformly decelerates to a stop...

(artificial intelligence) researcher from Stanford and member of the local ACLU Board of Directors, pointed out that such systems could pseudo-trivially be used to track and triangulate the location of cellular phones—and presumably their carriers. Interesting potential for covert surveillance or law enforcement—such as the FBI, which is already proposing that all phone systems be designed so they can wiretap at a keystroke, “whenever authorized by law,” of course. (They quaintly title it a “Digital Telephony” proposal, also another story.)

The cellular tracking technology is already there, and the government can (presumably) already use it. So why don't the cellular companies offer an instant-on tracking service for those cellular customers who request it—such as disgruntled car-jack victims? Seems like the only possible addition to the vehicle's cellular hookup might be an optional second “on” switch—so the phone would continue to broadcast its location even if a knowledgeable 'jacker turned it off at its normal switch.

PROPERLY DESIGNED LAPTOPS

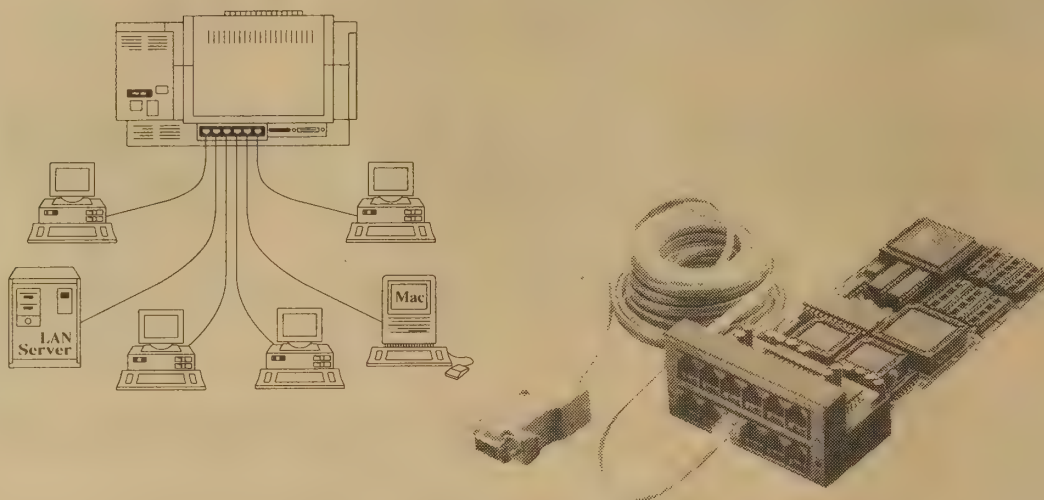
A few notebook-computer makers are finally offering *modern* computers: Their notebook systems are *designed* for expandability—just like all larger computers. The Outbound—the only legal Mac-alike



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NEWS & VIEWS

(Boulder, CO)—was the first one we knew of that allowed simple replacement of disk drives, memory, and CPUs by sliding one out and sliding a different one in—just like desktop units. In October, Amrel Technology (El Monte, CA) announced a line of field-upgradable laptops allowing the user to create 486s from 25MHz to 66MHz, with 4 to 16MB of RAM, 80 to 200MB of disk, SRAM cache, fax/modem, and a desktop dock with two 16-bit ISA slots.

There's obviously no technical excuse for continuing to make dead-end, nonupgradable laptop systems—nor to buy them.

QUICKIES

CFP'93, the Third Conference on Computers, Freedom & Privacy, is returning to the "correct" coast—scheduled for March 9–12, 1993, on the San Francisco Peninsula. For details, contact Bruce Koball, CFP'93 Chair, 22106th St., Berkeley CA 94710; (510)845-1350, fax (510)845-3946, email cfp93@well.sf.ca.us.

The California Public Utilities Commission has a BBS (computer bulletin board system) at (415)703-1297 (1200/2400, E71). It provides online access to meeting information, agendas, commission decisions, news releases, etc. Neat idea, but it does *not* seem to provide a channel for submitting testimony and public input to the Commission—apparently it's outPUC only.

The 1991 Computers, Freedom & Privacy conference was much concerned about unauthorized use of personal information. Participants received a roster of attendees, listing information that attendees had permitted to be distributed to participants. Within weeks, unrelated groups were direct-mailing to those names, promoting their ventures. Now, even COMDEX is using it. Ain't much privacy in the global village—with or without computers.

Former *Palo Alto Times* reporter Jay Thorwaldson, who covered the acid-eatin', dope-smokin' hippie '60s in which numerous current industry leaders gleefully participated, notes that, "I'm wired!" has a very different meaning when exclaimed by the technoids of the networking '90s than it did in those stoned-out '60s. Hmmm—or does it?

MIND-MELDING FOR ALL

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Warren founded InfoWorld, the DataCast proposal for paperless electronic newspapers, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's Computer Chronicles, founding editor of Dr. Dobb's Journal, and has chaired various trade and professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics & statistics, and once chaired the College of Notre Dame-Belmont Mathematics Dept.

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991) sponsored by a dozen nonprofit civic, professional, and industry organizations and received one of the first Electronic Frontier Foundation Pioneer Awards (1992). He is a member of the board of directors of Autodesk, Inc., and also chairs the Communications Committee of the California Public Records Act Reform Coalition.

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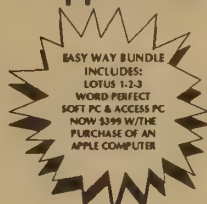
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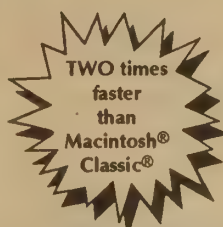
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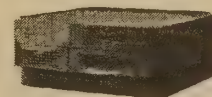
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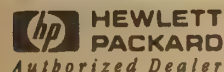
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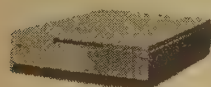
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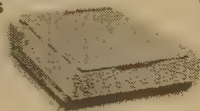


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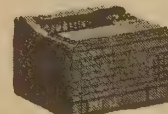
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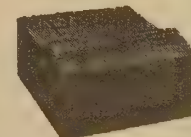
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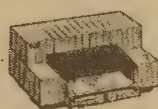
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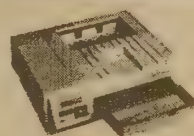
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NEWS & VIEWS

Is There An ACE? Yes, Virginia...

**BY JOHN
WHARTON**

Dear Microprocessor Report:

I am a graduate student in Computer Science. Lately some of my classmates have begun making fun of the Advanced Computing Environment. They say it doesn't exist. My adviser says, "If you read it in Microprocessor Report, it must be true." Please tell me the truth. Is there an ACE?

*Virginia Matsushita
Columbia University*

Virginia, your colleagues are wrong. They have fallen victim to the self-delusion that comes from failing to make a dent in the goings-on of the real world. They do not believe in an operating system they cannot revise to suit their every whim, and they feel no software can succeed that's not totally incomprehensible to the user. The minds of all academics are small, Virginia—BS or PhD—compared to the strategic acumen of an MBA or CEO. In the real world of business, their beloved UNIX workstations are a mere curiosity, a footnote, a drop in the bucket—a mote in the eye of a gnat, lying dead in the dust bin of history—as compared with the boundless sales of DOS-based notebooks, laptops, and PCs.

But worse, your colleagues are cynical, to question what others accept. In a simpler era they may have taunted their friends that Santa Claus didn't exist, despite the classic essay in the 1887 *New York Sun*.

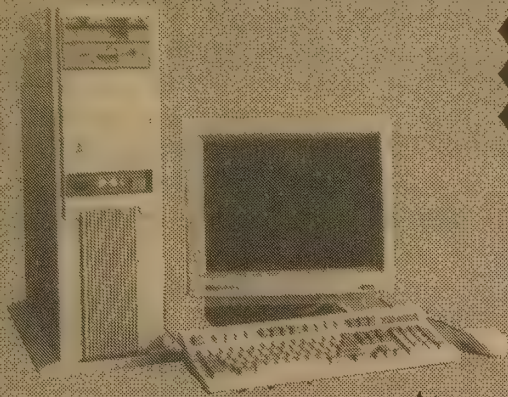
But yes, Virginia, there is a Santa Claus, and yes, there is an ACE. It exists just as surely as 640K limits, incompatible TSRs, and the "C>" prompt exist, and you know the vital role they play in preserving traditions of old. Alas! How dull and dreary this field would be if ACE were not to exist. It would be crippled as the legions of 486s waiting mindlessly for printers to acknowledge each byte, and as cloudy as the future of MIPS. The most powerful CPUs ever, then, might never achieve their goal.

Not believe in the promise of ACE? You might as well not believe in Windows/NT, or OS/2, or "Pink"—or in Fairchild, RCA, and Bell. Would so many sober-minded companies really stake their futures on a vision with no proven merit? Your adviser could assign all the students in Columbia to search for a single complete, comprehensive specification, or a single production system, or a single compliant application, but so what if they came away empty? What would that prove? The commitment of consortium members may dwindle, but that's no sign

**You can hold up
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emperor and
show that he
wears no
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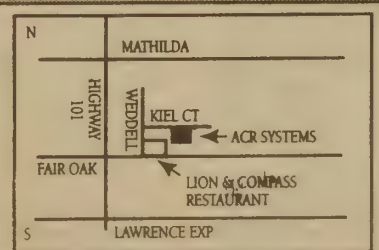
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ACE's future isn't bright.

The most real things in this field are often things no one can see. Have you ever seen a start bit, or page tables in RAM, or directory tracks on a disk? Have you ever, ever seen *anything* inside a hard-disk shell? Of course not, but that's no proof there's nothing there. No one has ever seen so much as a *product announcement* from NexGen, much less an actual part, but microprocessor groupies still look forward each year to hearing their latest plans. No one can conceive or imagine the wonders that exist, unseen and unseeable, in the minds of those who sell vapor.

You can hold up the Microsoft emperor and show that he wears no clothes, but software buyers care not. When a vacuum opens up, something rushes in, be it the fragrance of spring, or a stifling dreck. Natu-

**Once a void is
filled, the
Windows of
opportunity
close.**

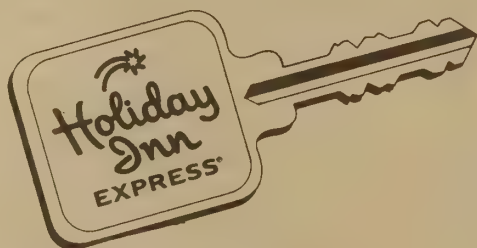
ral laws exist, laws which must be obeyed. But once a void is filled, the Windows of opportunity close. Marketing clout builds an inertia which not even the most technically superior product, from the strongest workstation vendor, could *ever* hope to deflect.

Only optimism, arrogance, and desperation—and yes, Virginia, a total disregard for responsibility to investors—would lead anyone to challenge the anticipated juggernaut of ACE, and come away with their spirits intact. But is all this real? Ah, yes, Virginia, in all this glorious field, not a single other force is so real and so forboding.

The promise of ACE exists, and it will continue to exist, for as long as the public wants to believe in software interchangeability across all hardware platforms. And it will thrive, and expand, and grow, Virginia, until it encompasses every ABI and system platform the market thinks it wants. In time, every prized feature and optional standard of every consortium founder may find its way under the unified ACE umbrella, and be able to claim compatibility under the continuously evolving spec.

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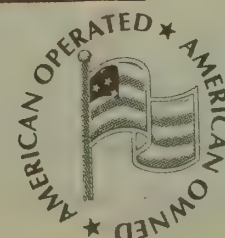
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Hackers In From the Cold

The Bizarre Tale Of A Secret Service Investigation Gone Awry

BY BROCK N. MECKS

On a cold, clear night this past November 6, young hackers converged on a shopping mall from all points surrounding the Washington, DC metro area in anticipation of the monthly 2600 meeting, an event that had quickly gained a kind of unspoken reverence among the DC area hacking crowd. The scenario for this gathering was minimalist: Meet, scarf some food, talk shop. Nothing more, nothing less. Easy, neat and clean.

But then something went wrong. Very wrong.

If the tale of this night weren't so bizarre it would be funny. But the incident that went down this November 6th, in a public place, in a crowded shopping mall, is anything but funny. It contains all the elements of a Cold War spy thriller: intrigue, cunning, deception and the fate of personal freedoms hanging in the balance. And an ending that just leaves you shaking your head in a kind of stunned fascination.

MALL COPS MEET THE SECRET SERVICE

About thirty kids had shown up this night to attend an informal meeting, loosely affiliated under the banner of 2600, the quarterly hacker magazine; 2600 promotes such meetings on the first Friday of each month at several spots around the country.

The kids were about halfway into various plates of food and drink when shopping mall security guards, acting under the direction of the United States Secret Service, surrounded them. No one was allowed to leave, and the security guards demanded that personal belongings such as backpacks and briefcases be handed over for inspection.

The move came as a complete surprise. In fact, no one was ever charged with a crime; no one was ever informed they were under suspicion of a crime. Secret Service agent David Adams did acknowledge that the agency had some kind of ongoing investigation, but he declined to give details.

The presence of the Secret Service agents is no surprise to the members of the 2600 meeting; a favorite—and surprisingly easy—game they play at the outset of every meeting is “spot the fed.” Agent Adams confirmed that the 2600 meeting at Pentagon City Mall has been the subject of “continuing surveillance.”

“We always knew that there were people monitoring these meetings, but that didn't bother us because we don't really have anything to hide,” said Emmanuel Goldstein, editor of 2600 magazine and an organizer of the meetings. The surveillance is so blatant that members attending one such meeting in September actually confronted Service agents they caught monitoring the session. When identified, the agents began asking questions about computer hacking and phone fraud techniques and devices. It was all like some kind of grand game. An episode straight out of those spy novels where KGB and FBI agents verbally spar with each other in public, while waiting to knife each other in the back at the first opportunity.

In all, five security guards, five undercover agents and two uniformed police officers took part in detaining, searching and generally

harassing the kids.

Some of the participants said no search warrants were shown. Despite this, they said, security guards confiscated items and refused to issue receipts for them.

WEIRD EVENTS, DIFFERENT STORIES

The Monday after this incident, mall Security Director Johnson told me in an interview that his security guards “were only minimally involved” in the detention of the kids.

Johnson kept insisting that he couldn't talk to me on the phone about anything that happened. When I asked if he would talk to me in person, he said no.

But he didn't stop talking.

Johnson told me that his staff was working under the direction of the Secret Service. “The Secret Service, FBI, everybody was here,” he said. “As far as I know, well, I can't say much on the phone, but someone's awfully paranoid apparently about what's been taking place here.” He declined to say what role the federal law enforcement officials played in detention, search and seizure.

“I'm not able to talk to you,” Johnson said. “As far as I'm concerned, we're out of this. The Secret Service, the FBI, they're the ones that ramrodded this whole thing.” He said the Secret Service and FBI “were working on their own, undercover. We never got anything [official] asking us to participate.”

When news of Johnson's confirmation of Secret Service involvement hit the networks, going out via the WELL, other reporters began calling to confirm the story.

But by this time Johnson was categorically denying any involvement by the Secret Service. He denied any kids were detained, he denied any items were confiscated. Suddenly he seemed to know a whole lot less than he had just hours before.

Something else he didn't know: I had taped my interview with him, in which he clearly states the Secret Service was involved.

Reporters called me, listened to the tape and called Johnson back. When he was informed that he'd been taped, he threatened to have me arrested. But I'd committed no crime. And I was never arrested.

Johnson still hasn't returned my calls to explain why he's continued to lie to other reporters.

Unlike other semi-coordinated raids the Secret Service has attempted on hackers, this incident seemed botched from the beginning. It was like no other hacker investigation, according to Michael Godwin, counsel for Electronic Frontier Foundation (EFF). The main reason: The use of mall security guards “is a first as far as I know,” Godwin said.

Several of the participants said they'd had items confiscated and not returned. But the Secret Service denied they confiscated any material, which is plausible: Participants said they couldn't be sure whether it was undercover agents or mall security guards who carried out confiscations.

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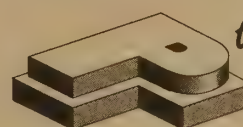
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Events deteriorated quickly, according to those present. When one hacker began writing down the names of security guards, Security Dir. Johnson snatched the list out of the kid's hand and tore it up. When another participant began taking pictures, security guards demanded his camera, removed the film and never gave it back.

Johnson denies any of these actions happened.

"This represents an outrageous level of harassment," Goldstein said. "I want to know what the mall cops were doing," EFF's Godwin said. "If the Secret Service used these private policeman to implement a search without a search warrant, there's no question that that's a violation of constitutional protections," he said.

The Secret Service agent in charge, William Clancey, said the agency has jurisdiction to investigate computer and phone fraud under Title 18 of U.S. Code Sec. 1030: "We are specifically mentioned in that legislation. We have jurisdiction to investigate these cases." But Clancey refused to comment on what moved the Secret Service to act on this night; he also declined to comment as to whether any of the hackers detained were under suspicion of any crime. "Apparently, the Secret Service was just trying to intimidate a bunch of young people," Goldstein said.

The Arlington Police Department's role seemed to be strictly backup. The Arlington police logs show that two officers were called to the mall, ostensibly by a report that a stolen credit card was being used by one participant. However, when the police arrived, participants said stolen credit cards weren't mentioned. An Arlington police spokesman later confirmed to me they were there at the request of the Secret Service, but declined further information.

In fact, the cops showed up in case official arrests had to be made. The Secret Service has no legal right to arrest inside a shopping mall; ironically enough, the mall's own security guards can't arrest you, but the local police can. That was their duty that night, but they went home empty-handed.

SMILE, YOU'RE UNDER ARREST

The fact that I was physically escorted from the Pentagon City Mall one month after the above incident, under the direct threat of being arrested, made up for an incredibly slow news day.

The trade paper I work for, *Communications Daily*, had just disgorged me from the crunch of my daily deadlines and I was mentally gearing up for what I thought would be my initial face-to-face confrontation with Security Director Johnson.

A month had gone by and Johnson had refused to return any one of my dozen or so calls.

I'd come to the December 2600 meeting with a set agenda: First, confront Johnson. Second, reintroduce myself to the hacker underground, a culture I have a true affinity for.

As I made my way to the mall I suddenly realized I didn't know who I'd be looking for; I'd never seen any of these kids before. Then I remembered a conversation I'd had that morning with a hacker called Inhuman: "You'll just know who we are," he said. And we dropped it.

He was right. When I reached the mall I spotted them right off, but opted to circle the group, cruising around, doing my own impromptu version of "spot the Fed." At the same time I was scouting for the Mall Administrative offices and looking for the Security offices.

Those objectives accomplished, I waded into the group and introduced myself to about 30 pairs of skeptical eyes. The handles flew at me fast and furious, names I'd heard before, others new.

I sat watching and listening to these kids, most of them a couple of generations younger than myself. Me, in an uptown grey pin-striped suit with leather suspenders. They, in an eclectic blend of street hip, anti-authority clothes. So much for the trade-offs of legitimate jour-

nalism: The corporate garb.

But the skins we wore peeled away nicely and I shifted through several different conversations as if I'd been a member of this fraternity for ages. I had at least fifteen years on most of them and yet it was they who were mentoring me: Education, real time. I was eating it up.

A writer for *Village Voice* wandered over and I decided that he and I would be allies for night. I decided that any confrontations would be better off if I had someone at my back, and another journalist was all the better. I tagged Julian (the VV writer) to help me in the search for Al Johnson. We never found him. Gone for the night.

In the absence of Johnson we asked the security guards on duty about the events of November 6th; they all denied knowing anything

Unlike other semi-coordinated raids the Secret Service has attempted on hackers, this incident seemed botched from the beginning.

about the events of last month. They don't even lie well, I thought to myself.

It's become obvious to me that the authorities are away on this night and that they don't want confrontation. But this is all going too smoothly for me. I came here to ask some legitimate questions. So I went seeking someone to answer them.

I found Santa Claus.

Well, Santa Claus is what he eventually told me his name was. In reality he is Lowell Davis, part of the Mall's Administrative management team. This particular night he was "MOD," Manager on Duty.

Julian and I had spotted him before, during our futile search for the elusive Johnson. Davis was painfully obvious. Actually, when Julian and I first spotted him we thought he might be Secret Service.

We dogged him to the mall office, but he wouldn't come out. So, when we spotted him standing up on the second floor, peering down at the meeting, a beefy security guard by his side, I tapped Julian and raced up the escalator.

I introduced myself by name and occupation. "I'm happy for you," Davis said.

"Are you associated with the mall somehow?" I asked.

"I'm associated with everybody. I just want... listen, before I talk to you guys, turn off those tape recorders..."

Continued on page 270

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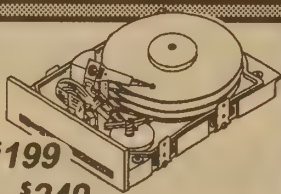
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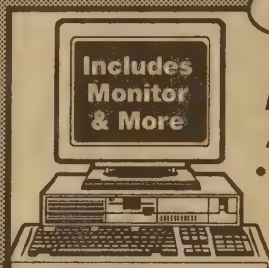
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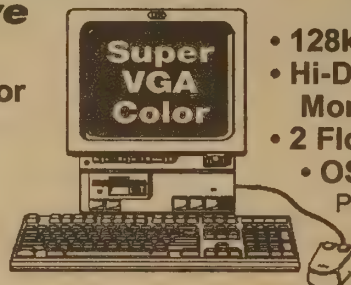
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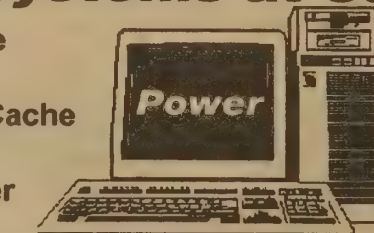
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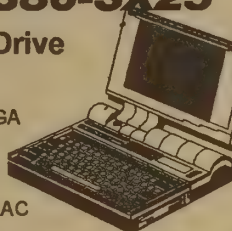
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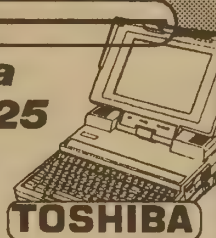
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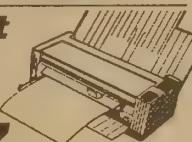


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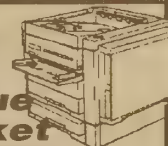
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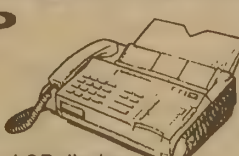
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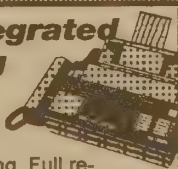
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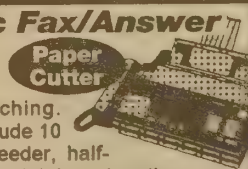
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EO, Inc.
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Mountain View, CA 94043
(415)903-8100

F8680 PC/Chip single-chip PC design
Chips and Technologies, Inc.
3050 Zanker Rd.
San Jose, CA 95134
(408)434-0600

Magic RAM line of PCMCIA 2.0 network adapter cards
Magic RAM
1850 Beverly Blvd.
Los Angeles, CA 90057
(213)413-9999

Pen Reference Design
Logitech/Gazelle
Contact: Tony Zank,
(805)520-8282

In his 1979 work *The Hitchhiker's Guide to the Galaxy*, Douglas Adams popularized the notion of the go-anywhere electronic book which, when hooked to the Galactic Net, would be updated with voluminous information from all over the Galaxy about almost everything imaginable.

We're finally beginning to see devices which, while far from matching Adams's imaginary creation, at least begin to include some of its features. We're approaching a vision of wireless network connectivity, where users in vehicles or on foot, wherever they happen to be, will be able to connect with other people and information databases. Unfortunately these wireless networks will, at least at first, be somewhat expensive to use, and intended only for small bursts of information such as traffic and weather reports, sports results, and the like.

Another approach promises to solve the problem in another way—rather than accessing these databases via wireless networks, you would carry them around with you like a book. This approach lets you distribute tens, even hundreds, of megabytes of information in compact, portable form, using current technology. Products such as the Sony Data Discman provide this level of functionality for the digital user-on-the-go, allowing people to access databases recorded on CD-ROMs.

However, the CD-ROM approach has some drawbacks—the high cost of the players (this will go down), the fact that they include moving parts (which have a tendency to break down or become misaligned), and the fact that they are vulnerable to vibration and shock when you're in a car or walking on foot.

Another technique for digital distribution of data is solid-state ROM cards, which can be plugged into palmtop organizers and computers such as the Sharp Wizard and the increasingly large line of PCMCIA-compatible machines such as the HP 95LX. As a variation on this technique, Franklin Electronic Pub-

lishers, Inc. has devised a machine whose sole purpose is to playback these ROM-card-based "electronic books." Because of its single-purpose design, the machine is quite small and relatively cheap. Franklin calls this the Digital Book System-1.

DBS-1

The Digital Book System-1 (hereafter referred to as the DBS-1) is a tiny palmtop with only one purpose: reading ROM cards with various kinds of information published by Franklin Electronic Publishers. It has 32K of RAM and no organizer functions at all, except for a tiny little notepad you can use to write down messages (only one message at a time, however). So don't throw out your Sharp Wizard just yet.

Each ROM card is capable of storing up to 45MB using Franklin's proprietary compression algorithm. The unit is small, just 3" x 5" x .5", but the keyboard is surprisingly easy to use. Many full-fledged palmtops larger than this unit could benefit from such an easy-to-use keyboard design. The display is 5 lines by 26 characters, and is capable of displaying bit-mapped graphics, though graphics are used only sparingly on the two ROM cards that come with hardware.

As shipped for this review, the unit comes with two cards installed: the Merriam Webster Dictionary Plus card and Franklin Word Games. The dictionary doubles as a simple thesaurus; it's extensive, but the definitions are rather brief, usually only a short phrase or sentence. However, this is sufficient to adequately define most of the words I tried. The

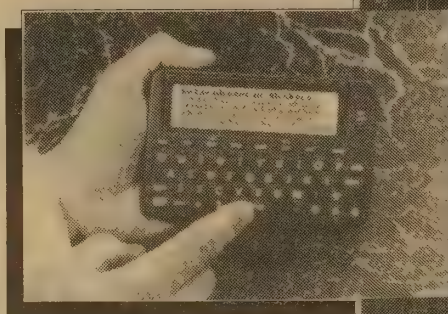
thesaurus function will typically list several other words with the same or similar meaning. Word Games includes a number of children's word games, ranging from the classic Hangman to a Tetris-like "Letris" game.

This technology has potential, but it's up to Franklin to exploit it. Since their ROM format is not an industry standard, they will be, at least initially, the sole publishers of "books" for their reader. Currently the unit only has two electronic books available in addition to those I tested: The Medical Letter, a medical reference, and the Video Companion, a guide to selecting rental videos. Price of the ROM cards varies from \$29 to \$99. Obviously the more books become available, the better the DBS-1's chance for success.

We'll see if Franklin opens up its "book" publishing business to third-party vendors; this could dramatically increase demand for the DBS-1 by increasing the size of the "electronic book" selection. This might not happen, however, since Franklin's compression scheme is highly proprietary. It only works well on text; large amounts of graphics and the like (for maps, etc.) will not likely be easily storable on one of these cards. This restricts the utility of the product to mostly text applications. However, the potential for restaurant guides, travel guides, and other textual reference material of all kinds is there.

The price of the unit, \$199 list, is not quite as low as one might hope; many full-blown electronic organizers can be purchased for that price, though they typically have only one card slot, not two, and they do not come with the dictionary and Word Games card.

Personally, I would prefer to be able to



The Franklin DBS-1: Books on the go.





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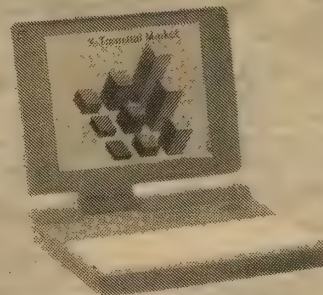


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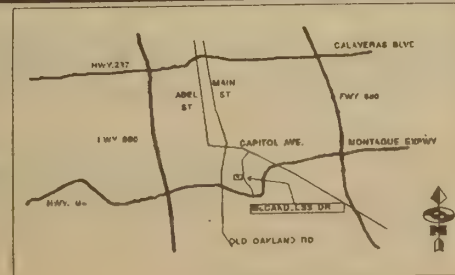
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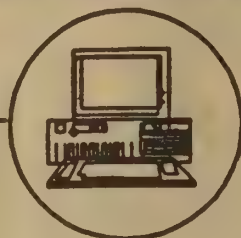


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purchase the DBS-1 with no ROM cards at all, for a lower price, and choose which cards I wanted to start with on my own.

Potential purchasers of this unit will have to choose between a full-blown organizer and something that is limited to only reading electronic books. The small screen also tends to limit its effectiveness. However, the advantage of the DBS-1 is that Franklin's entire operation is devoted to portable information publishing, and they have access to a very good compression algorithm, allowing them to cram more information onto a single card than most other manufacturers. In addition, the DBS-1 is quite small and very portable, with an excellent keyboard.

MORE PCMCIA MODEMS

Magic RAM has announced a line of PCMCIA 2.0 network adapter and I/O cards for palmtop and subnotebook computers. The three cards include an Ethernet, Token Ring, and 3270 Emulation Adapter, allowing you to directly connect your palmtop computer to a network or LAN at full network speed. The Token Ring and Ethernet adapters support NDIS and ODI drivers; ODI drivers are used with Novell and other networks, and NDIS drivers can be used with TCP/IP and Microsoft LAN Manager networks. The 3270 Emulation Adapter can be used to attach your palmtop to a host computer via controllers like the 3174 Establishment Controller, which is typically used in mainframe installations.

P.N.B., a French company, has announced another V.32bis/V.42bis fax modem, including several unique features. It comes with communications software for DOS and Windows which operates in five languages (English, French, German, Italian, and Spanish); it also supports voice digitization, permitting the reception, recording, and transmission of spoken messages and DTMF (a format used by a voice mail system); and it automatically recognizes the type of incoming call (voice, fax, or data). It also includes support for an acoustic coupler, allowing you to use the modem when an RJ11 phone jack is not available. In addition, the ROMs on the card can be modified or updated directly from a palmtop, allowing for upgrades to the modem's system software with very little difficulty. A lower-cost 2400 baud version is also available.

CHIPS AND TECHNOLOGIES

Chips and Technologies has long been well-known for its line of IBM-PC compatible motherboard controller chips; it has been one of the

chief suppliers of motherboard components for many of the PC hardware manufacturers for years.

Recently, C&T has begun to move into the palmtop and subnotebook market with the introduction of low-power, single-chip motherboard designs based on its PC/Chip F8680, which combines an 8086-compatible CPU with all the other support electronics typically supplied on a motherboard, all on one chip. A four-stage pipeline and up to 14MHz speed allow 286-level performance (however, 286- or 386-specific software will not run on a machine based around this chip.)

A number of palmtop PC manufacturers are planning on using the C&T design to create low-cost DOS-compatible PC palmtops and subnotebooks. For example, C&T is collaborating with Lexmark International to design and market a class of subnotebook computers called the MiniBook series. They intend to be operational for up to 40 hours on six AA batteries, include two PCMCIA slots, up to 640 x 400 pixel displays, DOS 5.0 in ROM, and performance up to 10MHz.

In another collaborative venture, Chips and Technologies has joined forces with Logitech to create a "Pen Reference Design" which will allow Logitech and other manufacturers to create low-cost pen-based computer systems for under \$500 list. This is not an end-user product, but a design that other manufacturers can start with to create their own pen-based machines. This design would allow up to 2MB of system RAM, which would dramatically reduce the price of basic functionality pen-based computing to well within the consumer price point. The only drawback to the system is that the CPU speed is still rather slow; experience has shown that adequate handwriting recognition really requires very powerful software, which in turn requires very fast hardware. (The Apple Newton, for example, includes an ARM microprocessor which is twice as fast as a Mac IIx.)

However, the C&T design for the first time brings PC-based pen computing in well under the \$1000 consumer price level, which

opens the door to a large degree of competition in the portable pen-based computer market. Supported pen-based operating systems include GeoWorks' Pen/GEOS, GRiD's PenRight!, and CIC's PenDOS.

BIG CORPORATIONS GET INTO SMALL COMPUTING

A new company called EO, Inc. has joined forces with some big-name multinationals such as AT&T, Matsushita, and Marubeni to create a product line they call the "personal communicator." The hardware is based on AT&T's Hobbit low-power RISC processor and the SDP16 digital signal processor (used for high-speed modem functionality), GO Corporation's PenPoint pen-based operating system, and PCMCIA 2.0-based technology.

AT&T has long been known for its world-class research facilities (Bell Labs is the equal of any national research lab in the country), but also for failing to deliver low-cost high technology to the general public. However, recently they've begun to try to turn their research prowess into actual products, and this may be one of their first major endeavors.

At this point it is far too early to evaluate AT&T's potential in this market; just being big doesn't mean you're going to make it in the small-computing world. AT&T does have immense brainpower in the form of Bell Labs, as well as admirable financial resources.

Sitka Corporation and EO, Inc. have announced a licensing agreement that will allow Sitka's mobile networking products, PenTOPS and PenCentral, to be bundled with the EO Personal Communicator 440 and 880. PenTOPS and PenCentral support peer-to-peer networking, and will allow the Personal Communicators to connect with DOS-based PCs via serial port or modem connection, allowing sharing of hardware such as disk drives, printers, and the use of network applications such as database servers. PenTOPS supports connections to Novell NetWare and LAN Manager networks as well. ■

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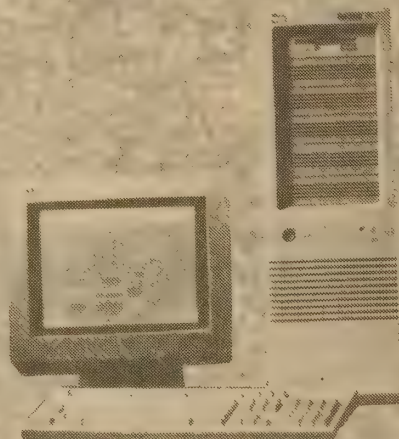
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486DX-66 EISA	\$865	\$1123	\$1386	\$1586	\$1669	\$1753
486DX-33/64K	595	838	1139	1339	1414	1498
486DX-33/64K	485	618	909	1109	1194	1278
486DX-25	190	348	609	809	884	978
386-40/64K	170	378	589	789	864	958
386-33/64K	165	368	579	779	854	948
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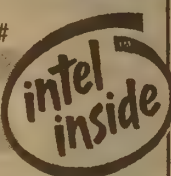
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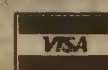
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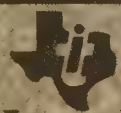
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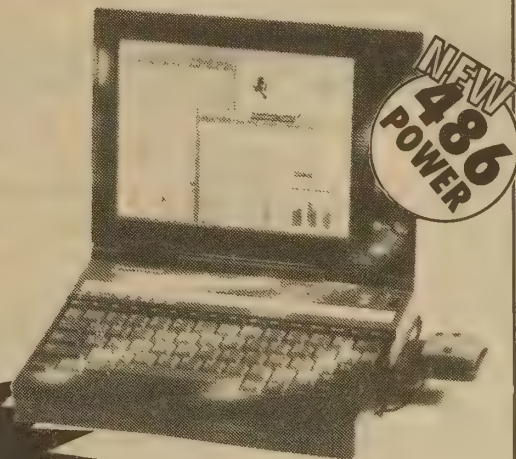
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A New Printer From An Old Friend

Smith Corona Presents A New Ink Jet Printer In Its Entry To The Printer Market

BY ED KAHN

The choices in inexpensive high-quality printers is expanding. The latest entry is, much to my surprise, a well-known name that has never before claimed a stake in the printer market. Smith Corona, the old line typewriter maker, has just introduced the Coronajet 200j printer that utilizes ink jet technology and carries a list price of under \$500.

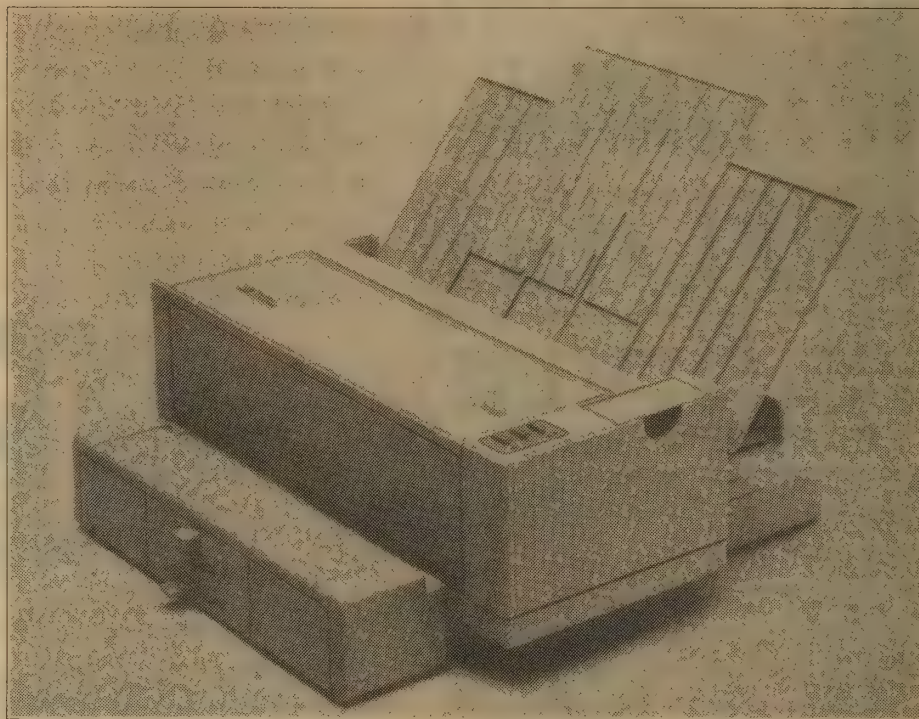
While not technically a portable printer because it offers no battery power supply, the Coronajet 200j is a formidable printer for home use or as a second printer for people working with notebook computers at an off-site location. The printer weighs a scant 6.4 lbs., has a footprint of 5.8" x 13.5", and measures 4.5" high. The basic printer handles single sheets of paper as well as envelopes, but a cut sheet feeder (\$89.95) is available and holds about seventy sheets of paper.

This printer invites comparison to a Hewlett-Packard DeskJet Plus—providing DeskJet emulation and twenty resident fonts. The Coronajet is a good deal smaller than the DeskJet as well as less expensive. But the print quality is in the same class, offering resolution of 300 x 300 dots per inch. The printer produces text at eighty characters per second in letter-quality mode and offers a draft mode that turns out copy twice as fast. This translates to a page output of between one and a half and two pages a minute—a bit slower than the DeskJet.

The Coronajet 200j arrives as a shoe box shaped unit. The top folds backwards to provide a gathering rack for pages that come from the printer. Like the DeskJet, the pages will pile up in reverse order. I like the arrangement of a regular LaserJet that spews pages out in the correct order. Single sheets and envelopes can be fed through a slot in the front of the printer.

While the standard Coronajet printer gets the job done, the cut sheet feeder is worth the extra expense. This accessory turns the unit into a first-rate printer that is more than adequate for anyone who does not demand high volume output.

Smith Corona has packed this printer with features. Thirty-one switches are provided



for selecting fonts, paper size, and a host of other choices that provides a great deal of flexibility. The printer will also respond to standard PCL3+ commands.

Besides paper, the only supply the Coronajet requires is the ink cartridge. This is available from Smith Corona, but you can also use a DeskJet cartridge, which means that it is readily available.

Without any documentation, I was able to have the printer working within minutes; it is designed so simply that you will do little more than plug it in, connect it to your computer's parallel port, and begin printing. When the documentation for this unit arrived a few days later, I discovered details about its operation that I would have missed otherwise. The spiral bound documentation is clearly written and extremely thorough. This is especially helpful for the novice who has not been immersed in the arcane language of printers.

Although the printer is designed to emulate the DeskJet, optional emulation cards allow you to choose the alternate emulations of either the Epson FX-850 or the IBM Proprinter (\$124.95 for either). The slot that holds these cards can also be used for memory

expansion cards. Both 128K and 256K sizes (\$129.95 and \$179.95) are available. These cards allow you to download additional typefaces. If you prefer, Smith Corona offers fifteen different font cards that fit into the slot. These range in price from \$89.95 to \$129.95.

Smith Corona has put a good deal of attention into the design of this printer. I noticed that the slot that holds these cards conforms to the PCMCIA standard. Nowhere in the documentation is this stated, but obviously they felt that using these specifications would add greater versatility to the machine. I tried to fit a 512K card into the unit, and it went in smoothly. Unfortunately, I did not have either of the two downloadable font card kits (\$59.95 each), which come on both 3.5" and 5.25" disks.

For a long while, portable computers were light years ahead of the printers. Now, thanks in large part to advances in ink jet technology, there are a number of choices open to the printer customer who wants laser-quality without the expense or bulk of a laser unit. The Coronajet 200j is certainly a printer to consider when looking for an ink jet machine. This unit carries a 12 month warranty.

RESOURCES:

Coronajet 200j, \$499.95
Smith Corona Corp.
65 Locust Ave.
New Canaan, CT 06840
(203)972-1471

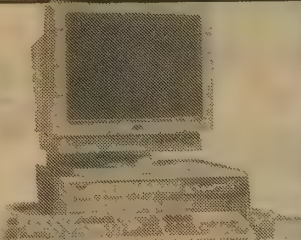
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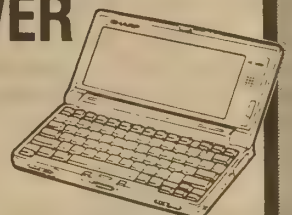


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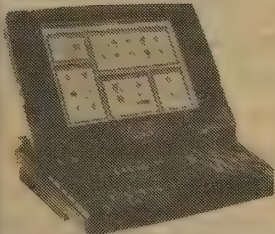
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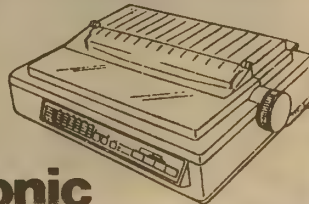
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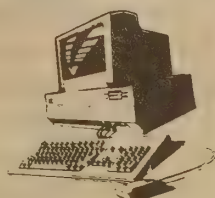
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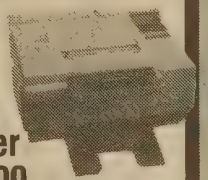
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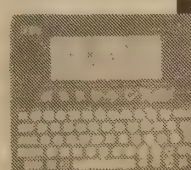
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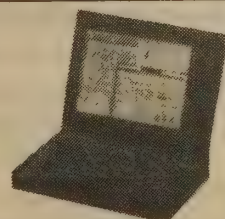
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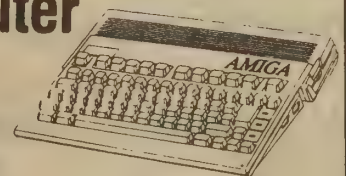
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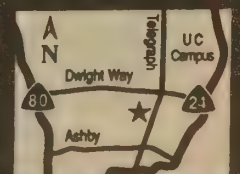


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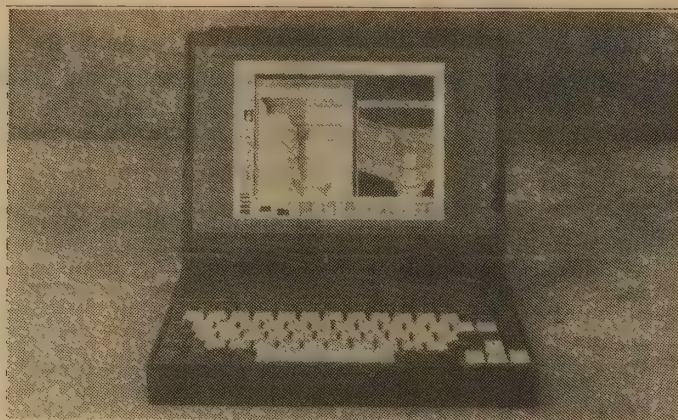
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COMPUTER of the month:

Dell 325NC



It is always a pleasure to review a new Dell computer as this company has established the highest standards for quality, workmanship, documentation and support. This new color unit is no exception.

The 325NC is a 386SL machine running at 25MHz. It comes standard with 4MB of memory, expandable to 12MB. Dell has designed this notebook so that users can easily install additional memory themselves. Simply open the compartment cover located just above the keyboard and slip in the memory modules. Full instructions are provided.

Upgrade costs range from \$149 for an extra 2MB all the way up to \$599 for an 8MB addition.

The computer weighs a little over 7 lbs., including the batteries. Its dimensions are 8.5" x 11" x 2.3." The basic model comes with a 60MB hard drive, but larger drives are available. To upgrade to an 80MB drive, add \$200. You can get drives with a wide range of capacities: 120MB (add \$400), 200MB (add \$600).

The screen size is 9.25" measured diagonally. This is a far cry from the first color computer I used several years ago. That technology was so primitive that I actually preferred a monochrome display. While active matrix LCDs offer superb quality, in many ways comparable to a CRT monitor, passive matrix displays still do not reach that level. Nevertheless, it is quite acceptable in this computer—the passive matrix display certainly beats even the best monochrome displays. If you want a larger screen, Dell provides a port for attaching a VGA monitor. I found this unnecessary, but if I were working with this computer all day, I might prefer to use a standalone monitor as it would offer a larger display.

The keyboards on Dell computers are well-designed, with the cursor keys in an inverted T formation. Separate keys are provided for PgUp, PgDn, Home, and End. An embedded numeric keypad is provided, but if you can't stand that arrangement, you can buy a separate numeric keypad (\$149) from Dell or attach a full keyboard of your choice to the unit.

Dell has designed this computer for long operation on the rechargeable Nickel Metal Hydride battery. Even without implementing the power management options, you can expect to get three hours use from a fully charged battery. One of the features of the computer is a battery gauge that will tell you at any time what percent of the charge is still in the battery. Additional battery packs are available for \$169. Dell has included a sophisticated power management system. The options allow shutdown of the serial and parallel ports, display, and the hard drive. There is a suspend button located on the top of the machine that shuts the unit down and returns you to where you left off when you hit any key. An internal battery allows you to change the Nickel Metal Hydride battery pack without powering down the whole machine.

Although there is only one serial port, Dell has thoughtfully included a mouse port as well as a compartment for adding a modem. Two models are available: a 2400/9600 baud send/receive fax modem (\$299) and a 9600 baud send/receive fax modem (\$599). Fax software is included.

Dell sells a wide range of hardware as well as software options. Virtually everything you might want for the computer is available: numeric co-processors, external floppy drives, battery chargers, automobile power, and tape backups are some of the available options. You name it and Dell can supply it. Dell also sells software. The advantage of buying the software from them is that they install it as well as send you the disks. So when you get your machine, it is ready to run.

One of the hardware/software options is a package including MS-DOS 5.0, Windows 3.1, and a Microsoft ballpoint mouse that attaches to the side of the computer. This package costs \$200 and is highly recommended. While I prefer a standard mouse, this one is certainly convenient, especially when traveling.

A final option is a roomy carrying case (\$99). A slip case comes with the Dell 325NC, but does not have compartments for all of the things you need to carry along with the computer.

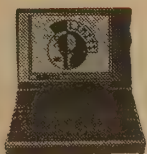
Like all Dell computers, the 325NC comes with a one year warranty and a bunch of technical support phone numbers for locations around the world. With a Dell product, you get a top tier machine for a little less money.

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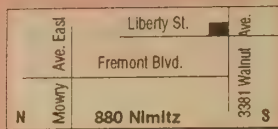


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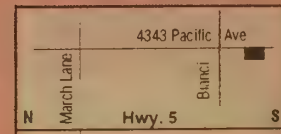
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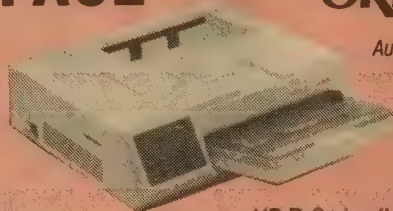


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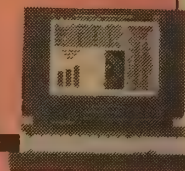
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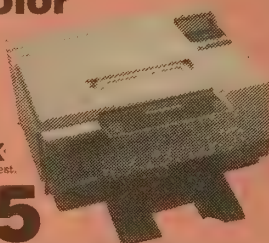
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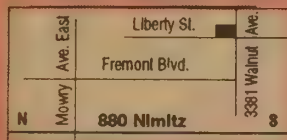
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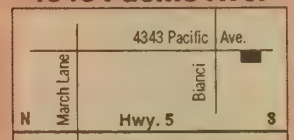
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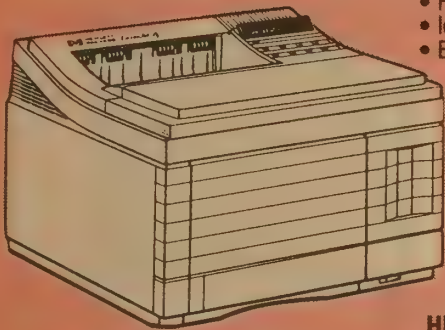
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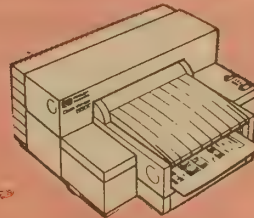
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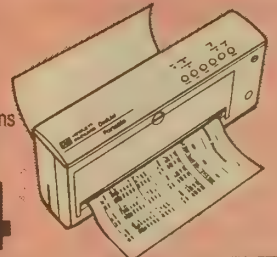


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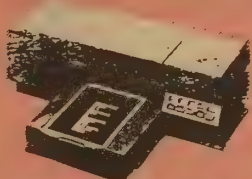
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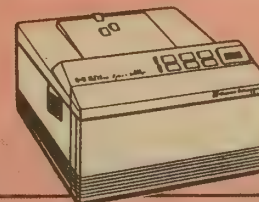
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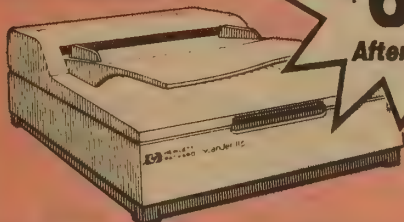
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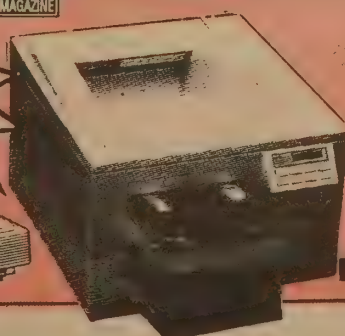
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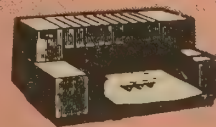
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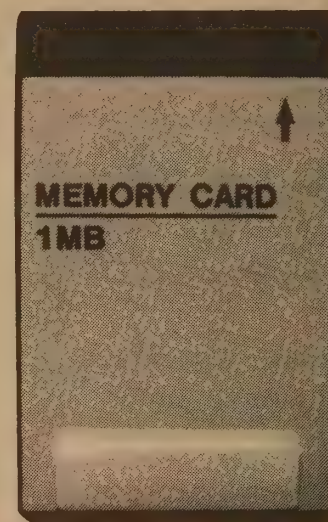
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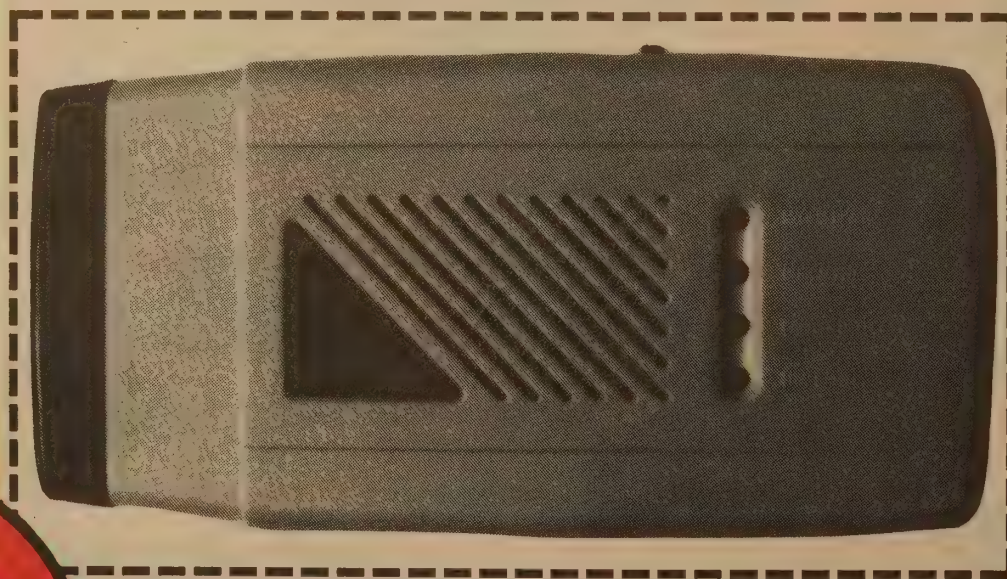
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Telecommuting Programs That Work

Telecommuting Becomes An Established Part Of The Work At PacBell

**BY ROBERT
MOSKOWITZ**

Many articles and discussions of telecommuting treat the subject as if it were theoretical, or an activity seen only among a fringe group of privileged employees or fondly tolerated specialists. But nothing could be further from the truth. Telecommuting is no more theoretical, no more a fringe activity, than carpooling or conducting business over cellular telephones.

According to Link Resources, a New York City-based research and consulting firm that conducts the National Work-at-Home Survey every year, about 39 million people did at

they just don't get press coverage for their efforts toward telecommuting."

PACBELL TELECOMMUTERS

California companies in particular, which have been quietly leading the charge toward more telecommuting, can boast quite a few successful telecommuting programs that have advanced well beyond the pilot stage to become an established part of organizational work patterns.

Pacific Bell, for example, has over one thousand telecommuters staying home from the office at least one day a week. At one time, there were about two thousand PacBell employees telecommuting regularly, but over the past few years the company has been encouraging people to take early retirement, and many of those who retired had been active telecommuters. Of those who remain on the job, few, if any, have elected to stop telecommuting.

Most of PacBell's telecommuters are staff support people working in Northern California. They live in widely dispersed communities, often a long way from their primary office assignment. Many are "project managers" for specific new product and business-development projects. Telecommuting offers them a perfect opportunity to increase productivity and eliminate one or more round trips to the office—much of their work involves reading, writing, and talking on the phone, tasks easily accomplished off-site. One task that a typical PacBell teleworker might do while working at home would be to write specific business operating procedures. For example, sales support personnel will often work at home while writing the procedures that sales people must follow to implement a new or additional telephone service for a PacBell customer.

Few of PacBell's sales people now telecommute, but they do in AT&T and other telephone companies. PacBell management,

California companies can boast quite a few successful telecommuting programs that have advanced well beyond the pilot stage.

least some of their work at home during 1992, up from 25 million in 1988. Of these 39 million, 8.6 million do company work after normal business hours using computers, modems, faxes, or extra phone lines installed at home. In addition, nearly 24 million people are working part- or full-time at home as self-employed business owners or consultants. But the most relevant number for a discussion of telecommuting is the 6.6 million bona fide teleworkers who operate from home part- or full-time during normal business hours.

"People are telecommuting much more now than in the past," says Gil E. Gordon, a well-respected consultant on flexible work options, based in Monmouth Junction, NJ. "There are more teleworkers in 1992 than ever before, both in sheer numbers and also in the diversity of the types of jobs and types of organizations in which they work. But it's hard to hear about their successes. Much of what happens takes place in smaller organizations that do it a few people at a time, and

Low-Tech Satellite Centers Work Well for PacBell

PacBell's satellite centers look nothing like a high-tech jumping off point for telecommuting workers. The centers look just like a normal office, furnished with cubicles, 1980s-style standalone desks, and such low-tech equipment as file cabinets, bookcases, and a phone. Each cubicle has a computer, and a central equipment room contains a copying machine and a fax. Each satellite center also has a PacBell Communications System (or Centrex) that provides telephone service and allows 3-way calling, voice mail, and other special capabilities.

Each of the satellite centers is hooked to the local area network for the office it is most often serving—the North Hollywood center is hooked to downtown Los Angeles, and the San Francisco center is electronically linked to San Ramon. The network supplies the teleworkers with centralized word processing capabilities, as well as access to PacBell's usual office databases.

If a telecommuter at one of the centers needs special access to a particular company database, their computer is fitted with a modem and programmed for dial-up access as required.

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increasingly eager to expand the telework option for employees as a way of streamlining the organization and improving productivity, is now starting to encourage this group to explore the potential for working from home one or more days per week.

RECENT STUDIES SHOW...

PacBell's telecommuting program began in August of 1984, mostly in response to the Olympics held in Los Angeles that year. Following an explicit request to reduce the number of employees commuting to and from work on the city's freeways during the Olympic period, PacBell included as one of its list of alternative work options the chance to telecommute from home or from an outlying office. Telecommuting was so well received and worked so smoothly that PacBell immediately put together a task force to oversee a formal pilot program, which began in May of 1985 with just one hundred telecommuters. Six months later, the task force conducted a formal survey of the telecommuting employees and pronounced the program to be very successful. Productivity was up. Morale was up. Costs were down. And there were no major problems caused by the telecommuting work habits of the pilot program participants.

The decision was made to expand. By May of 1986, a second survey found the telecommuting workers had continued to perform well and had created no serious problems for their colleagues who worked five days per week in PacBell offices. The number of telecommuters continued to grow until it peaked at about two thousand in 1987.

A third survey conducted in 1988 found that telecommuters and their coworkers were still satisfied and still productive. But the disbanding of the company's telecommuting task force and the lack of any program advocate was contributing to a gradual dwindling of participant numbers. This was also about the time that PacBell's new emphasis on early retirement began to systematically reduce the number of telecommuters within the company. A fourth survey during 1989 to assess attitudes within PacBell found continuing satisfaction and success, and led to the development of a formal policy on telecommuting, officially promulgated during the winter of 1989.

Rather than dictate exactly how telecommuters must behave, PacBell's broad policy gives supervisors considerable room to tailor each telecommuting arrangement to meet the particular needs of any department, any position, and any eligible employee.

A fifth company-wide evaluation of telecommuting, conducted in early 1992, produced numbers showing an intensely interested senior management at PacBell that

Excerpts From Pacific Bell's Telecommuting Policy

Definition: Employees "telecommute" when, on a periodic basis, during their scheduled work hours, they fulfill their job responsibilities at a site other than their primary business location by substituting telecommunications for work-related travel.

Pacific Bell considers telecommuting to be a viable management [salaried employee] work option that, when appropriately applied, benefits both the company and the individual.

Telecommuting is a cooperative arrangement between a supervisor and a management employee, not an entitlement, and is based on: the needs of the job, work group, and company; and the employee's past and present levels of performance.

Jobs suitable for telecommuting are characterized by clearly defined tasks and deliverables. A telecommuter's performance is measured by results, not work location.

Telecommuting does not change the basic terms and conditions of employment.

Each telecommuting arrangement will be cost-justified, subject to benefit tracking and reviewed for continued mutual benefit at regular intervals.

Each telecommuting arrangement is jointly agreed between supervisor and employee; telecommuting is voluntary and may be terminated at any time, at will, by either the company or the employee.

telecommuters were still satisfied, still productive, and still appreciative of the opportunity to eliminate some of their trips to the office. For the fifth time out of five surveys, supervisors expressed no major dissatisfaction with telecommuting and mentioned no major problems caused by the program.

A SUCCESSFUL POLICY

As of today, the program is firmly embedded within PacBell's everyday organizational structure. For example, there is no longer any form of unified telecommuting "program," and no company-wide program administrator or coordinator. Responsibility for making and overseeing specific arrangements with individual telecommuters has been passed directly to the company's departmental supervisors, who are encouraged to make their decisions regarding telecommuters on a case-by-case basis.

According to Carol Nolan, PacBell's resident "Telecommuting Expert" who formerly ran the program and who still acts as a consultant for outside companies considering telecommuting as an option for their employees, "Pacific Bell's telecommuting program is deemed a success, all the way up to the highest levels. We've evaluated it many times for productivity, cost to the organization as a whole, and so forth, and we're very pleased. Our employees are extremely satis-

fied with telecommuting. In fact, many tell us they would have quit—taking with them our entire investment in their training and experience—if we had not given them the option of working from home part of the time."

Because there is no overall telecommuting coordinator or administrator, any PacBell employee who thinks he or she might want to start telecommuting starts the process by going to his or her supervisor and asking about a telecommuting arrangement. If the supervisor is agreeable, they review PacBell policy and see if the employee is eligible for telecommuting. Most salaried workers are.

Assuming the employee is eligible, the supervisor and employee then work out the details together:

Where will the employee work? At home, or at a PacBell satellite office near home? PacBell currently has two satellite centers: one in North Hollywood to serve downtown Los Angeles, and—curiously—one in downtown San Francisco to accommodate those whose jobs were transplanted thirty miles away to San Ramon.

What equipment will the employee need? PacBell policy allows for the company to supply any needed equipment, from paper and pencils to a portable computer and modem. But the policy—intended to be as flexible as possible—is careful not to require that a telecommuter use any equipment more complicated than a telephone.

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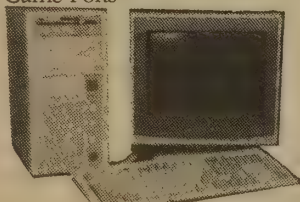
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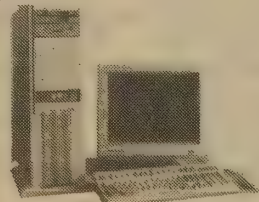
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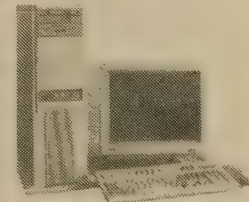
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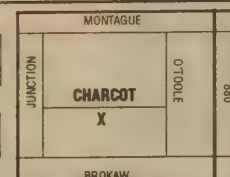
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What work will the employee perform? Some tasks are suitable for telecommuting, others are not. It's important that the supervisor and employee determine exactly what parts of the job can be accomplished away from the office, and what parts cannot.

What hours will the employee work? Although many teleworkers enjoy the freedom of working unusual hours, it's important that they be available some portion of the normal workday so they can more easily coordinate

with others and respond to coworkers' needs.

By what means will the employee's supervisor get in touch with him or her during working hours, and how will the employee communicate with others in his or her workgroup?

What will be the employee's performance objectives? How will they be measured? How often?

When all the details are agreed upon, the supervisor and employee execute an agree-

ment, date and sign it just like a contract. This not only makes clear to the employee the importance of adhering to these requirements, it gives the supervisor confidence that the employee knows exactly what is and is not expected while working away from the office.

TRAINING AND BEYOND

At one time, there was a required training program for PacBell's telecommuters. But when telecommuting began to be decentralized, training began to be de-emphasized. So far, this appears to have had very little impact on productivity or employee satisfaction with

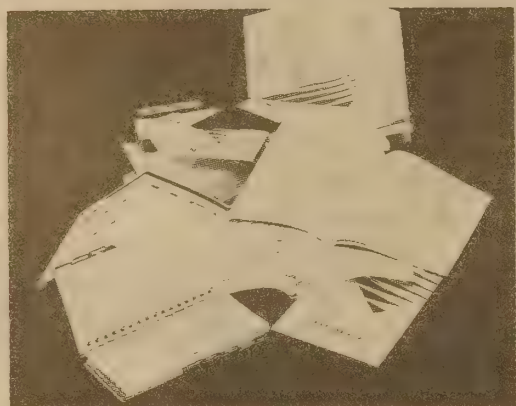
Rather than dictate exactly how telecommuters must behave, PacBell's broad policy gives supervisors considerable room to tailor each telecommuting arrangement to meet the particular needs of any department, any position, and any eligible employee.

telecommuting. However, a PacBell subsidiary, Telesys Management Institute, has just begun to develop and offer two separate but coordinated training programs for teleworkers and for their managers. Based on the training curriculum originally developed and used during the early years of telecommuting at PacBell, these new training programs remain optional so far.

According to Carol Nolan, "the kind of high-level employees who tend to get involved with telecommuting also tend not to need training in how to be self-disciplined and self-motivated, how to keep in touch with coworkers, or how to handle the responsibility of working alone at home."

Next month: a discussion of satellite centers, including those owned and operated by an individual employer and those set up and run by independent firms for use by employees of any interested organization. ■

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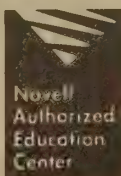


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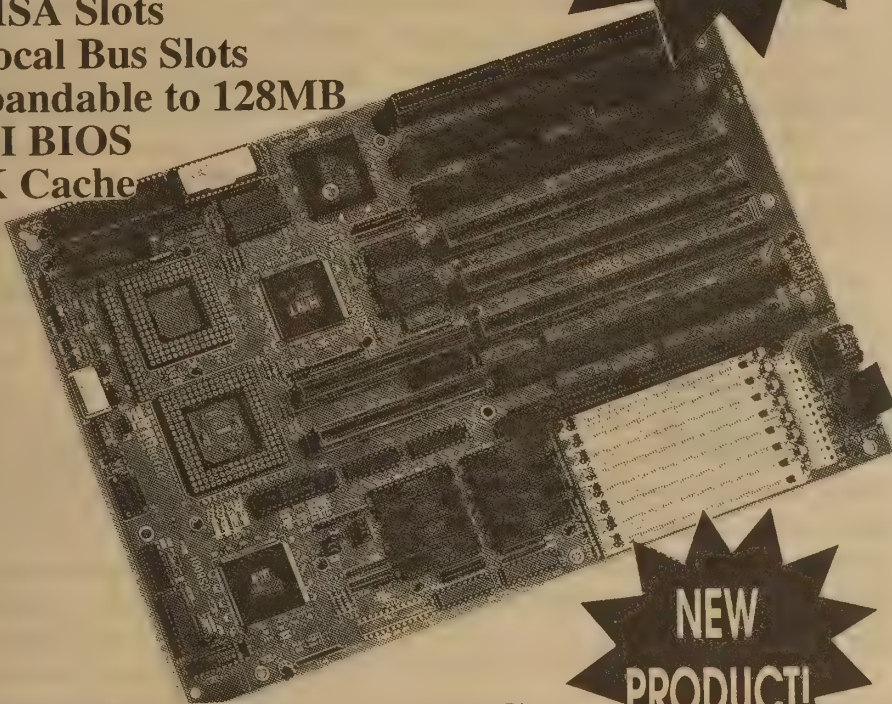
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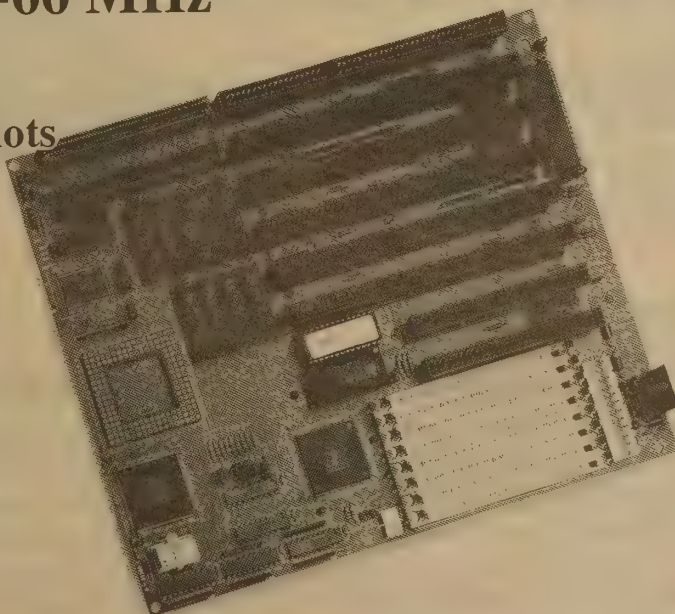


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PCMCIA Moves To The Network

Emerging Standard Offers Unique Advantages

BY YACCO

PC Cards were originally developed for handheld machines like the HP 95LX, and adopted by notebook machines like the Toshiba T3300SL. They've evolved with the guidance of standards groups such as JEIDA (Japan Electronic Industry Development Association), JEDEC (Japan Electronic Devices Engineering Council), and PCMCIA. Now these standards have consolidated, and in consolidating, created a force that is going to change the PC.

Industry pundits are predicting that by 1995 there will be some six million portables with PCMCIA slots, and that slightly over a

plugging in something else. (Of course, desktop machines could easily provide a score or more tiny card slots, but as long as vendors like Apple have a stranglehold on users of their proprietary systems, they will probably always use a limited bus to push users into their top-of-the-line machines. At least, PCMCIA will make it harder for them to do it.)

There are also longer-term advantages that will emerge when systems are designed around the PCMCIA bus. For example, PC Cards have low power requirements (National Semiconductor's LAN adapters require just 1.2 watts maximum, 0.8 watts typical). Sys-

tems using them will require smaller power supplies.

will further increase the market for PC Cards and continue to drive prices lower. All of that's great for buyers, but not the main reason why vendors are going to climb aboard in droves. The main reason you'll be able to select PCMCIA-bus PCs from many vendors is that mass retailers are going to love them, and pull them into their huge marketing channel.

Mass merchandising isn't about knowledgeable sales staff. It's about products that sell themselves. Retailers want impulse items that sell in blister packs, not gadgets that have to be installed by technicians. That's practically the very definition of the PCMCIA bus. So vendors that offer PCMCIA machines will sell more—a goal of every major vendor. The last year has shown that companies—e.g. Compaq and Apple—that lower prices also increase sales and, in the case of Apple, make record profits. Doldrums-bound IBM has reorganized to follow suit. PCMCIA will sell more, and with lower production costs, make

LOCAL AREA NETWORKS

million LAN adapters will be sold that year. However, these estimates do not take into account the number of desktop solutions that will be available for PCMCIA.

This year's COMDEX was loaded with notebooks and handhelds that accept PC Cards, as well as a large showing of the cards themselves. It's the availability of cards that will stimulate more system development. I think we'll see a number of PCs with PCMCIA slots at next year's COMDEX. That will spur even more PC Card development, and within two years, PC vendors will be able to begin offering desktop systems in which the PCMCIA bus is the primary or only bus.

There are overwhelming reasons for PC vendors to do this, and they're not just the advantages that PCMCIA offers to the user.

ADVANTAGES OF PCMCIA

The immediate advantages of PCMCIA to the user are obvious: simple installation, hot swapped repairs, and even hot swapping of functionality. It's unnecessary to open your computer to add your network adapter—merely plug in a PC Card. If a LAN interface goes bad, just pull it, and plug in another. That's hot swapping.

It works for ordinary operations too. You'll be able to plug in a modem PC Card, download a file, swap the modem for a flash-memory PC Card, and store the data before

Again, this will make it hard for certain vendors to inhibit expansion by underpowering their systems to the point that third-party manufacturers have a problem designing enhancements.

Furthermore, a PCMCIA system with its

It's unnecessary to open your computer to add your network adapter—merely plug in a PC Card.

smaller power supply, hard drive, CD-ROM, and floppy should have a footprint about the size of a shoe box. That's not only great for LAN workstations, it's great for any cost-conscious consumer too. Manufacturing efficiencies have brought today's PCs to the point where they're practically priced by the pound. So smaller PCMCIA systems will further reduce hardware prices once demand kicks into play.

Cards too. Barry George, D-Link's vice president of marketing, says his PCMCIA adapter "will have a projected cost lower than any of my current internal adapters." Finally, PCMCIA can provide the same bus for the PC that it provides for other architectures such as Mac, UNIX, and PDA. This interoperability

more money at lower prices.

PCMCIA ON THE DESKTOP

I could be wrong, but all this seems inevitable. George seems to agree. "The PCMCIA market is more than a portable market," he says. "It's an efficient and time-saving standard for corporations to install and maintain desktop machines."

The technology is ready. Socket Services is the BIOS-level interface that provides access to the host computer's PC Card slots (sockets). Socket Services identifies the number of available sockets, detects the insertion or removal of cards (allowing hot swaps), and interfaces with Card Services. Card Services provides the interface that manages software;

Continued on page 272



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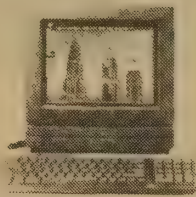


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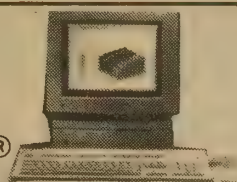


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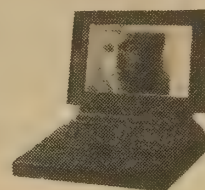


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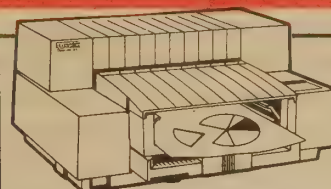
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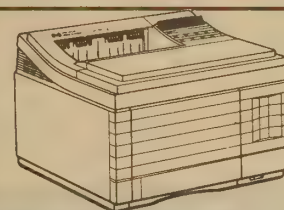
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The New And The Old

The Mach³⁸⁶ Hybrid From Mt. Xinu

BY BENNETT
FALK

UNIX

There was a time when people thought that the only reliable knowledge was old knowledge, and proving anything was mostly a matter of finding the most ancient and revered authority who supported the thing to be proved and hoping no one else would cite a more ancient and revered authority in support of a contrary position. Thinking about things in this way precipitated a brisk business in forged antiquities, new books attributed to ancient authors.

Eventually keeping track of the ancient and revered authorities became problematic. Some people decided that things could be known reliably on the authority of their own experience, thank you very much, and in a few years there were people who thought the only reliable knowledge was new knowledge.

1993 will be the year the software industry indulges its fascination with "new technology." We are already caught up in something like an ideological war between novelty and legacy. One of the objectives in this war is to foster the conviction that "new" and "old" are intrinsic properties of products. Some products, it is claimed, represent "new" technology. By inference, anything that lacks the features of the "new" products must be "old," and the further jump from being old to being antique seems almost inconsequential.

Novelty, of course, is a tricky thing: It is no mean feat to convince anyone that something new can be more reliable than something that has worked perfectly well for years. Nor is it easy to describe new technology without constantly referring to its predecessors. There is more continuity between new things and old things than one might expect from listening to marketing pitches.

Before getting lost trying to figure out what new and old are, it may be worthwhile to have a look at a hybrid product that shows some of each.

MACH³⁸⁶

Mach³⁸⁶ release 2.5 is an operating system based on Mach from Carnegie Mellon University and fully compatible with the 4.3 release of Berkeley UNIX (4.3BSD). Mach³⁸⁶ is a product of Mt. Xinu (510/644-0146) in Ber-

keley, a small company renowned for championing various incarnations of Berkeley UNIX and having a sense of humor.

As the name implies, Mach³⁸⁶ is an operating system designed to run on computers using the Intel 80386 microprocessor. (Mach is probably best known to the general public as the operating system bundled with NeXT computers. It should be noted that NeXT's graphical user interface is not part of the Mach³⁸⁶ package.)

Implementations of Berkeley UNIX for small computers using Intel processors are not numerous. Sun Microsystems ventured briefly into this territory five years ago with its 386i hardware. In the last two years, *Dr. Dobbs's Journal* featured a series of articles describing the project of porting Berkeley UNIX to the 386. Mach³⁸⁶ is a rarity: a generic BSD system for 386-based PC-AT class hardware.

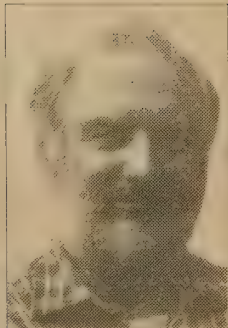
Mach³⁸⁶ is shipped in an almost ludicrously small package that contains only the diskettes and a slim, staple-bound paperback manual. This is refreshing in a time when UNIX software commonly ships with three shelf-feet of documentation.

A full set of documentation is provided on diskette, but clearly you'll have to get through the installation successfully to make any use of it. Using the online documentation, I was surprised at how careless I've become in reading manuals. Configuring the system to use a serial mouse and setting up the configuration files for the "tip" program required several iterations of reading the manual and experimenting. The Mach³⁸⁶ documentation needs to be read carefully.

Installing Mach³⁸⁶ is relatively easy. The hardest part of the procedure is disk initialization. Mach³⁸⁶ expects to coexist with MS-DOS on hard disks, and the installation worked quite well on a disk that contained some MS-DOS partitions and some free partitions that could be used by Mach³⁸⁶. Incorporating an entire SCSI disk whose only partition table had been created by a non-DOS operating system was less straightforward.

Like any version of UNIX for a "generic" architecture, Mach³⁸⁶ includes a list of officially supported hardware. The Mach³⁸⁶ list is not as comprehensive as the list for, say, SCO UNIX or Interactive UNIX, and the list is

Implementations of Berkeley UNIX for small computers using Intel processors are not numerous. Sun Microsystems ventured briefly into this territory five years ago with its 386i hardware. Mach³⁸⁶ is a rarity: a generic BSD system for 386-based PC-AT



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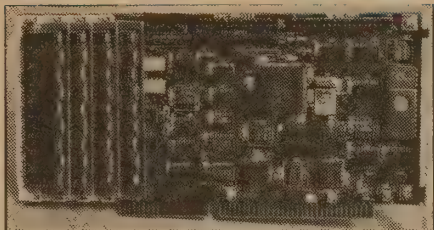
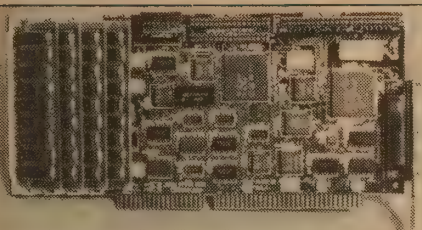
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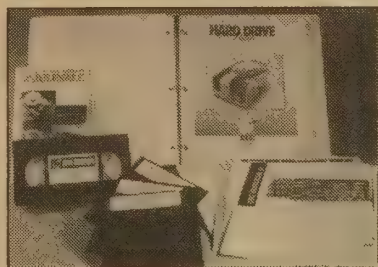
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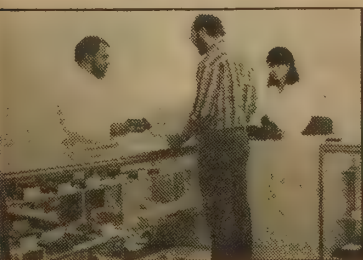
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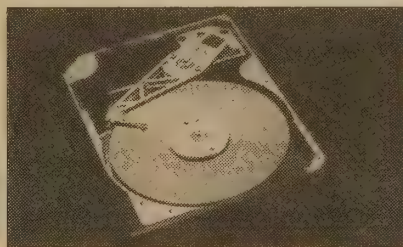
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quirky in some respects. The Microsoft Bus Mouse is not supported, for example, and the descriptions of VGA boards in the XWindows setup seem to have a number of blind spots. (In fairness, it looks like the configuration can be adjusted to accommodate just about any board available, but you have to know a lot about your board to succeed.)

Still, the system is generally robust. It installed easily and ran well on a now-ancient 16MHz Wyse 386 PC with 6MB of memory, a built-in hard disk, an external SCSI disk on an Adaptek controller, a Compaq VGA card, and a Microsoft Serial Mouse. Trying to run Mach³⁸⁶ with less than 6MB of memory is probably not wise. Running both Mach³⁸⁶

TABLE 1

CPU-INTENSIVE TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Executing fcalle	0.34	0.32	0.261
	0.2	0.2	0.202
	0	0	0.02
Executing fcalla	0.13	0.12	0.103
	0	0	0.045
	0.01	0	0.024
Function Call Overhead			
	0.21	0.20	0.158
Executing loop	1.8	1.91	1.009
	1.7	1.8	0.937
	0.03	0.04	0.029
Executing scall	2.45	3.04	2.535
	0.25	0.32	0.218
	2.13	2.65	2.239
Executing sieve (100 iterations 1899 primes)			
	9.05	10.42	5.134
	8.9	10.28	5.044
	0.04	0.03	0.04

TABLE 2

DISK-INTENSIVE TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Executing dwrite	0.33	0.5	1.38
	0	0	0
	0.25	0.24	0.171
Executing dread	0.65	0.35	0.377
	0	0	0.006
	0.23	0.26	0.247
Executing pipes	1.23	1.28	1.294
	0	0	0.013
	0.53	0.62	0.714

TABLE 3

MULTIUSER TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Shell 1	2.47	1.83	1.702

	0.08	0.1	0.104
	0.6	0.58	0.594
Shell 2	2.18	2.66	2.202
	0.18	0.19	0.21
	1.2	1.11	1.139
Shell 3	3.45	3.76	3.257
	0.18	0.34	0.325
	1.86	1.62	1.725
Shell 4	3.86	4.59	4.309
	0.31	0.43	0.415
	2.32	2.29	2.298
Shell 5	4.77	5.74	5.362
	0.38	0.6	0.513
	2.91	2.9	2.913
Shell 6	5.71	6.71	6.594
	0.48	0.68	0.617
	3.53	3.6	3.472

TABLE 4

COMPILER TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Compiling dwrite.c	4.76	4.1	3.286
	1.11	1.14	0.796
	1.39	1.18	0.778
Compiling dread.c	3.4	3.45	2.225
	1.11	1.17	0.878
	1.12	1.15	0.805
Compiling fcalle.c	2.81	2.6	1.401
	0.7	0.54	0.389
	0.99	0.86	0.541
Compiling fcalla.c	2.62	2.58	1.308
	0.57	0.45	0.351
	1.03	0.84	0.542
Compiling loop.c	2.83	2.92	1.578
	0.65	0.57	0.416
	1.07	0.98	0.733
Compiling pipes.c	3.1	3.16	1.962
	0.94	0.86	0.736
	1.08	1.02	0.768
Compiling scall.c	2.73	2.51	1.437
	0.62	0.41	0.363
	1.02	0.82	0.534
Compiling sieve.c	3.01	3.29	1.89
	1.07	0.96	0.687
	1.04	0.9	0.735

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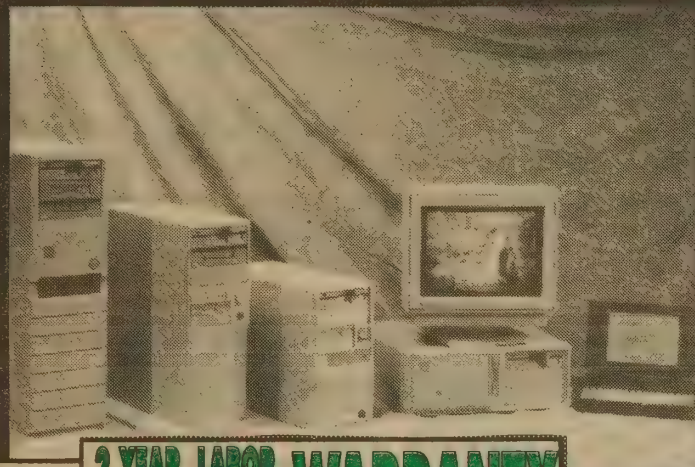
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and X Windows comfortably will require 8 to 12MB.

The software bundled into Mach³⁸⁶ is a very generous package, including most of the features that one expects from Berkeley UNIX which might be regarded as add-on products for other UNIX releases. The basic Mach³⁸⁶ operating system supports socket-based networking using either Ethernet or serial lines. (There is a network development package that can be added to the base setup.) There are also utilities to manage network news.

The base package includes a complete development system with gnu extensions (bison, emacs, gcc, and gdb). A GUI using X Windows is also available as a package separate from the base operating system.

The distribution depends on uucp, SLIP, and tip for communicating with other computers via modem, and it would have been very helpful if a better interactive communication package (something on the order of Kermit) had been included. Somewhere there are undoubtedly Korn Shell devotees who

will complain over the absence of the Korn Shell.

In general the system's performance is very good. Using the truly venerable UNIX benchmark tests based on those first published by David in *BYTE Magazine* 1983, Tables 1-4 below show Mach³⁸⁶'s performance in several key categories. The results of the same tests on older versions of XENIX and SCO UNIX are included as well. All figures presented are the averages of ten iterations of the whole test suite; all the tests were run on the same hardware (XENIX was tested using only 2MB of memory.)

The tests that were run fall into four categories. The CPU-intensive tests measure speed of computation ("sieve"), system call efficiency ("scall"), looping efficiency ("loop"), and the overhead involved in using function calls ("fcall") in place of simple assignments ("fcalla"). The disk-intensive tests measure disk read ("dread"), disk write ("dwrite"), and pipe throughput ("pipes"). The "shell" test measures the system's multiuser capacity by running up to six concurrent sessions. Finally, the time required to compile the C source code for the other tests is included as a general measure of compiler efficiency.

If BSD is the only sort of UNIX that feels comfortable to you, Mach³⁸⁶ is a good way to feel at home on your 386 PC. The system generally behaves as expected, and little things like the BSD style of shuffling jobs between background and foreground count for a lot.

Mach³⁸⁶ is certainly not for everyone. Finding commercial applications that have been ported to Mach³⁸⁶ may be difficult, but it should do very well as a relatively inexpensive platform for a networked workstation. Source code for applications to run under 4.3BSD should compile without grief in the Mach³⁸⁶ environment, and there is no shortage of interesting software in the public domain.

Quite apart from either performance or utility, the distinguishing feature of Mach³⁸⁶ is its hybrid character. It is essentially a product in which new and old technologies are combined. Mach offers resources for multithreaded programming and extends the use of client/server concepts to components of the operating system.

This hybridization is proceeding rapidly. Sitting on the desk is the packet of diskettes that make up Release 3.0 of Mach³⁸⁶, in which the claims of new technology are made more forcefully. The new release relies on "microkernel" architecture to implement a system in which the user can move easily between operating environments as disparate as DOS and UNIX, and should make for very interesting reading next month. ■



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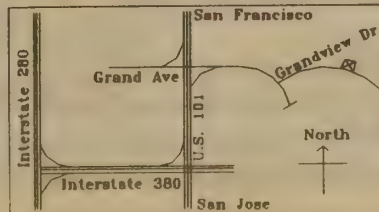
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Portable Computing Arrives

A View From The Portable Computer Expo

**BY MICHAEL
ROBIN**

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Computers are no longer *just* a part of our lives at the office and the home, increasingly they are an integral part of our lives wherever we are—at home, the office, or anywhere in between. To support this trend, making portable computers easier to use, more versatile and reliable, an abundance of small—and getting smaller—notebook computers, peripherals, and related devices are available. To spotlight the growing range and diversity of products, the Cordless Computing Company (formerly the Connecting Point Laptop Center) brought together manufacturers and end-users at the Santa Clara Convention Center on December 3 for the Portable Computer Expo.

The center of attention was clearly the portable computer, with over a dozen vendors demonstrating the latest in portable technology. Some of the most popular notebooks on display included the new Apple Duo notebook that features an integrated desktop docking station, the Bondwell notebook with its matchbook-sized 42MB removable cartridges and companion drives that fit into your desktop computer, and the new IBM color 486 ThinkPad with its removable hard drive and built-in easy-to-use joystick-like pointing device. (This pointing device rivals only the trackball on the Apple PowerBook as the most convenient pointing device on a notebook!)

Some computers, such as the introduction of the BCC Avanti color laptop, were not yet available in the stores. One of the nicest features on the Avanti computers is a pivoting display that slides into place behind the keyboard, requiring less space when open as well as giving the user a more balanced unit to work with. The color Avanti will be shipping in February 1993.

There were also several sub-notebook or palmtop computers, including computers from GRiD and Mitsuba. This was also one of the first opportunities for people to see and work with the Vista PC-Tablet from Bel-Air Technologies. Slightly larger

than a sheet of paper, weighing only 2.2lbs., the Vista features an Intel 286 processor and 10" LCD VGA screen, with 640 x 480 resolution. It uses standard PCMCIA memory cards and operates on four AA alkaline or rechargeable batteries.

But, the portable computer—whether a sub-notebook, notebook, or larger "luggable" portable—was only part of the show. One of the most interesting communication tools was the CompuSet headset from Plantronics. Connecting between the modem and telephone, it lets you switch between a voice and data connection on a single telephone line. This is ideal for working from a remote location that offers only a single line, such as a hotel room. The computer

will dial your home office, let you talk with coworkers, and can become a data line for transmission without having to hang up and change the wire connections. When you are talking on the phone you still have complete control of your notebook computer to continue working or taking notes from the call.

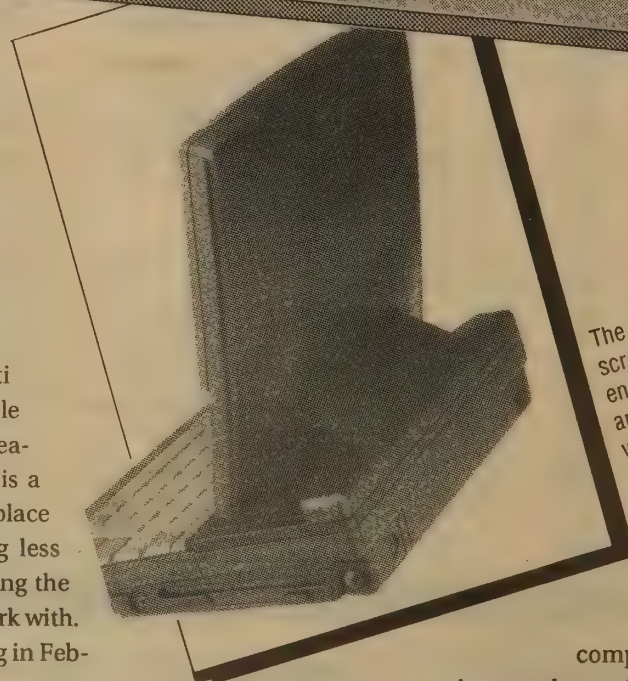
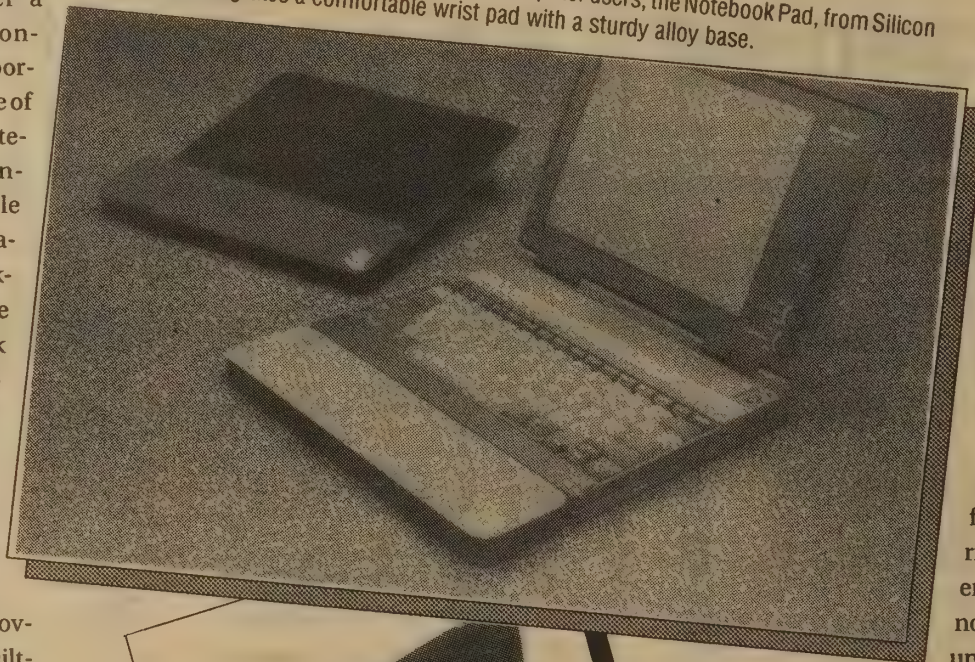
Portable computer users are at no less of a risk from repetitive stress injuries (RSI) than desktop users. Although wrist pads are now common on most desks, until recently there have not

been good comparable products available for notebook computers. However, Silicon Sports, the same people who offer us an excellent selection of keyboard and mouse wrist pads, has developed a Notebook Pad. Integrating its neoprene wrist pad with a light alloy base, the Notebook Pad offers your wrists a comfortable and safe place to rest while typing, as well as a stable flat surface to hold your notebook.

The BCC Avanti's screen pivots to ensure comfort and ease-of-use when your working space is limited, such as on airplanes.

The Portable Computer Expo included almost every imaginable device for portable computers, from printers and modems to carrying bags and security devices; there was even a portable, battery-operated, full-page scanner from NISCAN, the NISCAN Page scanner. This show, and future shows planned by the Cordless Computing Company, demonstrates that everything you need for portable computing has arrived. ■

Designed to meet the needs of notebook computer users, the Notebook Pad, from Silicon Sports, integrates a comfortable wrist pad with a sturdy alloy base.



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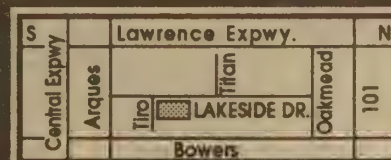
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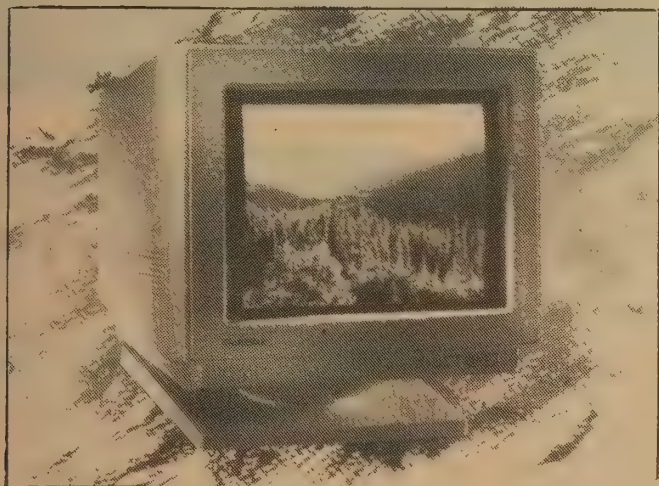
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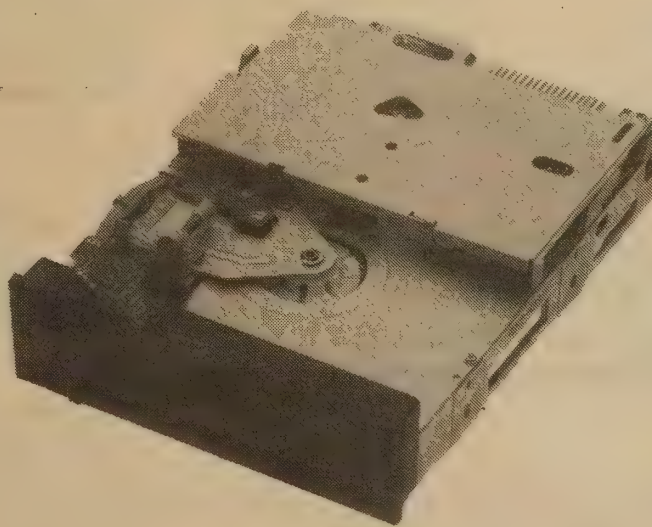
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2 MB Module	199

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80287-10 10 MHz	59
80C287-12 12 MHz	89
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80387SX-20	85
80387DX-20	85
80387DX-25	75
80387DX-33	89
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4167-33 MHz	595
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83087-16	59
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30F5348 512K Kit	\$54
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6450603 1 MB Module	
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6450609; 34F30xx	100
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Mdls 70-A21; -A61; -B21; -B61	
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NCR 6435 Laser	
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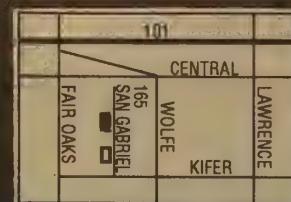


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Viewsonic 4E/5E/5+	283/383/483
Viewsonic 6E	323
Viewsonic 6FS	584
Viewsonic 7	960

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IDE cache controller (promise)	145
Adapted SCSI 1542KB w/Kit (ISA)	260
Ultrastor SCSI 24F	454
Ultrastor ESDI 22F/22C (EISA)	478/674

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Maxiswitch	31
Keytronics	36
Focus 2001/3001/5001	41/61/71
Omnikey 102 /Ultra	81/111

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Logitech Mouseman Serial (400dpi)	61
Logitech Mouseman Bus (4000dpi)	65
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- TEAC 1.2MB & 1.44MB FDD, 200MB IDE HDD.
- 2S / 1P ports, 101 Keyboard, Calcomp 12X12 digitizer
- Full size vertical case, DOS 5.0
- #9GXI TI 34020 graphics processor based card.
- 1280X1024 res. 60 or 72Hz refresh rate.

\$3,395

Desktop Publishing

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- TEAC 1.2MB & 1.44MB FDD, 200MB IDE HDD.
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- HP LaserJet III with LaserPix 5.0
- 2400 DPI (graphics), 1200 DPI (text), 35 PostScript matched fonts
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DrawingManager

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- TEAC 1.2MB & 1.44MB FDD, 200MB IDE HDD, Mouse
- 2S / 1P ports, 101 Keyboard, Desktop case, DOS 5.0, Windows 3.1
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- Raster background & editing in AutoCAD
- Large size scanner (up to E size) and high resolution (up to 600 dpi)
- Large size digitizer (up to 36X44)

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True Color System

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- 2S / 1P ports, 101 Keyboard, Vertical case, Windows 3.1, DOS 5.0
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- #9GXI TC(L29) TI 34020/40MHz graphics processor based card.
- 1280X1024 resolution 64K, 1024X768 24-bit color

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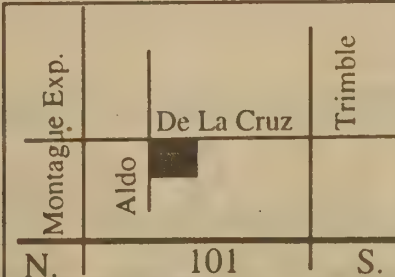
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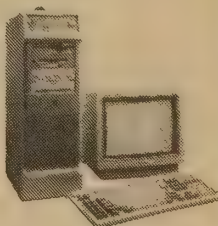


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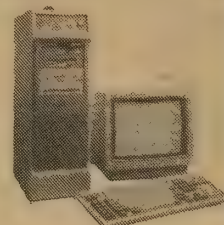
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- * TEAC 1.2MB Floppy Drive
- * TEAC 1.44MB Floppy Drive
- * 101 Enhanced Keyboard
- * Microsoft Compatible Mouse w/ Pad
- * 2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Ports
- * Tower Case w/230 Watts Power Supply

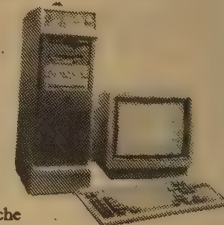


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- * 1280x1024 & 16.8 Million Color
- * TEAC 1.2MB Floppy Drive
- * TEAC 1.44MB Floppy Drive
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- * Logitech 3-Button Mouse w/ Pad
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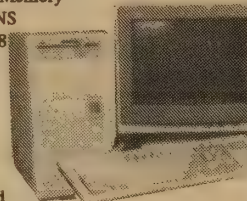
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- * 1.2MB Floppy Drive
- * 1.44MB Floppy Drive
- * 101 Enhanced Keyboard
- * Microsoft Compatible Mouse w/ Pad
- * 2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game
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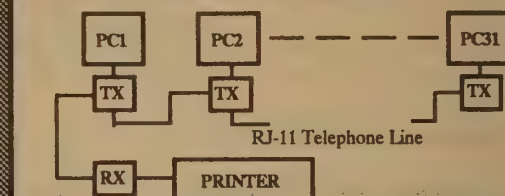


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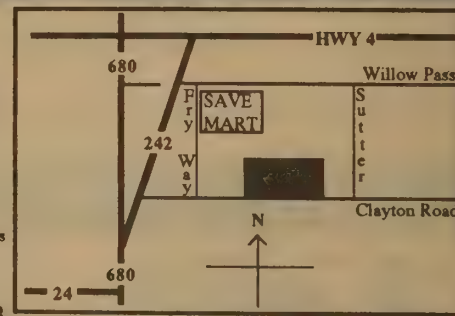
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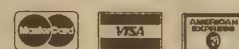
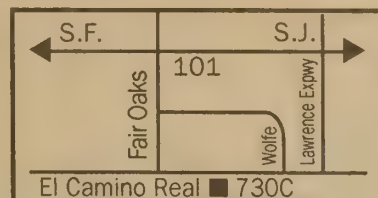
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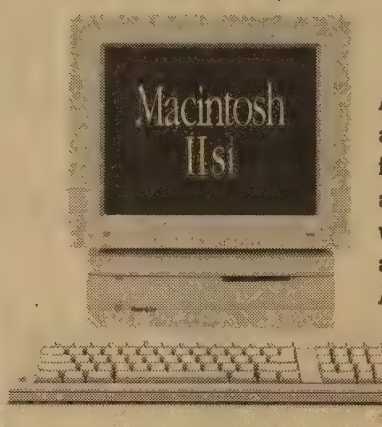
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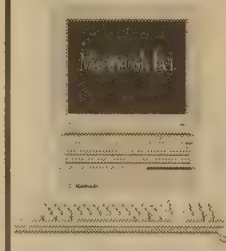
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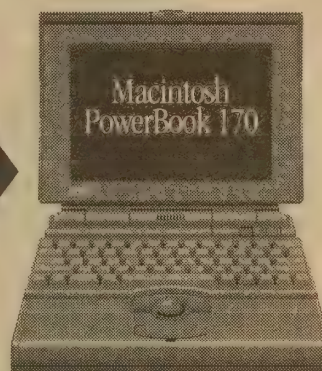
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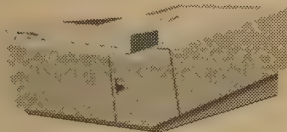


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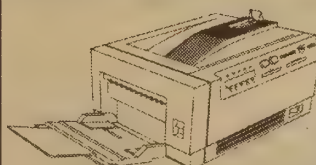


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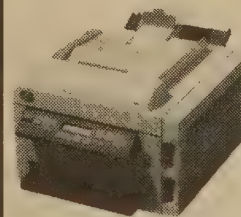
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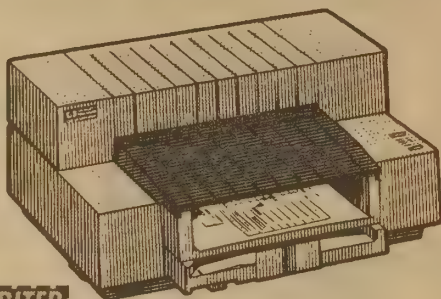
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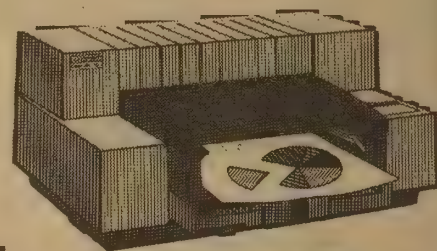
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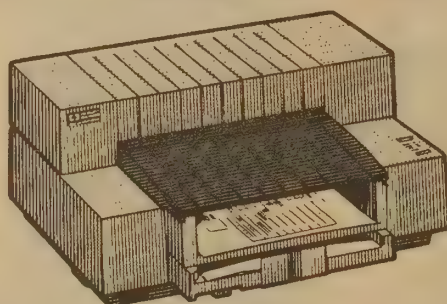
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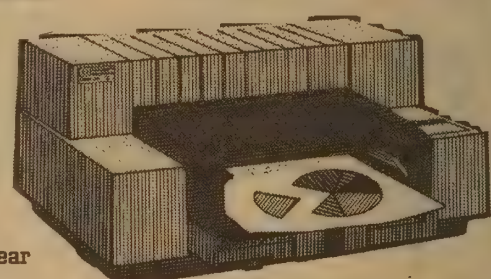


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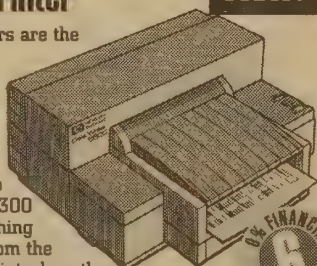


DeskWriter 550C Printer & DeskJet 550C Printer



New!

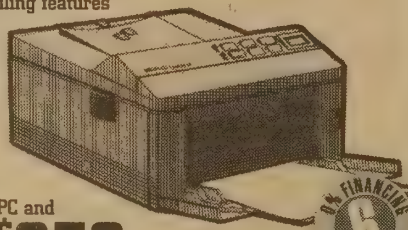
These capable new printers are the perfect answer for small businesses that do occasional presentations and graphics. They'll give you full color output for beautiful pictures or true black output for crisp text, all at a laser-quality 300 dpi—and all without switching ink cartridges. Choose from the DeskWriter 550C for Macintosh or the DeskJet 550C for DOS and Windows.



HP LaserJet III Printer



This LaserJet is a perfect match for small businesses. It's compact but powerful, with great paper-handling features and faster print speed than other printers in its price range. The III also features built-in type scaling and upgradeability to PostScript® for PC and Macintosh.



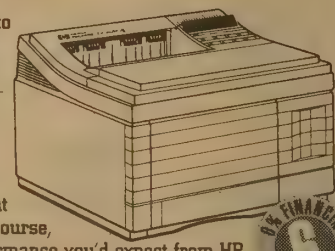
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* Hurry! Rebate Ends 1/31/93

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CCWSCA0014
Monitor Extra



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w/40 MB HD



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- 200 watt power supply

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- DOS 5.0
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#CCWSCA0017
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- Power Menu
- McAfee Antivirus
- 1-year depot warranty

#CCWSCA0002
Monitor Extra



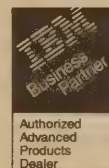
\$1899.
w/170MB HD



IBM PS/1 Consultant



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Model 2133653

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Includes: MicroSoft® Windows 3.1™, MS DOS® 5.0, UltraFont, trackball mouse, instructional video.



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gives Windows a rocket boost

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Includes: MicroSoft® Windows 3.1™, MS DOS® 5.0, UltraFont, trackball mouse, instructional video.

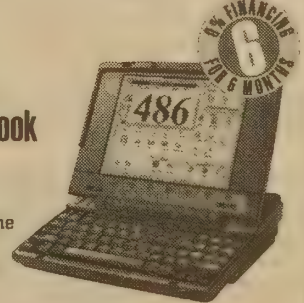


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- WinFax
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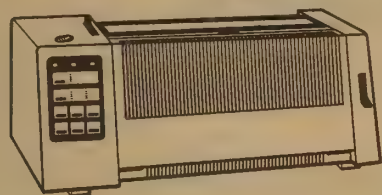
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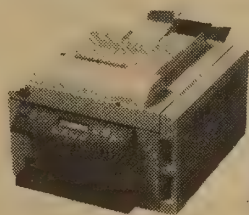
IBM® PPSII 2380



IBM takes impact printing seriously as you and your business. This solid, reliable 9-pin printer is built with a straight paper path so six-part forms and thick paper print right the first time.

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IBM® Laser Printers 6 & 10



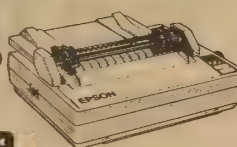
IBM's Laser 6 and 10 come standard with a 200-sheet tray, and IBM's Print Quality Enhancement; optional envelope and extra paper drawers and an option for PostScript®.

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9 Pin • SmartPark™ paper handling • 200 CPS Super draft • 30 CPS NLQ • High resolution graphics

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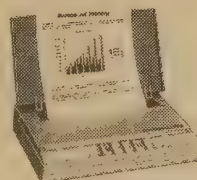
269.



Canon BJ10ex

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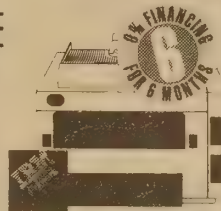


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- Pro keyboard with 49 large velocity-sensitive keys, 128 instruments and sounds • Full orchestral accompaniment
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System
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ALLSOP Dual Disk Drive Cleaner CK-50



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Manufacturing Company, Inc.
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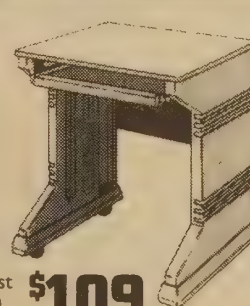


Universal Printer Legs
\$7⁹⁵

MicroComputer
Accessories, Inc.
A RUBBERMAID COMPANY

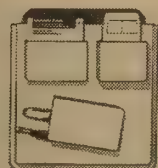
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A mobile, compact and self-contained computer desk for the home or office • Glide-out keyboard drawer with built-in wrist rest/storage compartment #1050



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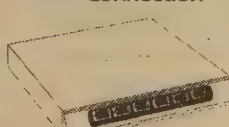
Mouse w/software
AC-ME01
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MicroComputer
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monitor stand
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System
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Power Control
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Mouse/Wrist Pad Set



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79¢ each

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The Mikey Awards

Top Ten Computer Games Of 1992

*Sharply Falling Computer Prices Helped To Make 1992
A Boom Year For Entertainment Software*

**BY MIKE
MARKOWITZ**

On the MS-DOS side, which represents at least 85% of the market, significant trends included the growing dominance of Microsoft Windows, the shift to Super VGA as the video graphic standard, and the increasing importance of stereo sound output, either as a built-in feature of the system or as an add-on component. On the Macintosh side there was less to celebrate, although a few determined publishers continue to develop great products.

On both sides, the most alarming trend was the rampant increase in the size of games. It is now common for a single game to take up 5-10MB of hard disk space. For most users, installing a new game now requires a painful decision about what to delete to create enough space.

The long-term solution is probably the CD-ROM, which can store enough program code, high-resolution animated graphics, and digitized sound (about 500MB) to meet the most exacting demands of the next generation of gamers. A CD can be mass-produced at lower cost than the typical stack of floppy disks a state-of-the-art game requires. It is also ready to play right out of the box, without the elaborate installation and decompression routines gamers must now endure. And copy-protection is not even an issue, at least until erasable optical media become commonplace. As more titles are published and drives get cheaper and faster, let's hope that 1993 will finally be the Year of the CD-ROM in computer entertainment.

PICKING THE BEST GAMES

Judgments about the quality of most software products can be based on more or less objective criteria: performance benchmarks, comparative lists of features, documentation, support, etc. But judgments about the quality of a game are ultimately subjective: Did I have fun or not? What is fun for you may be boredom or torment for me.

In my own game evaluations I try to consider four main elements: graphics and animation, sound, user interface, and overall value. Attributes of a game are rated on a scale from 0 (the worst) to 9 (the best). "Graphics" includes the artistic quality of the images, the smoothness and realism of the animated motion, and effective use of color (if applicable). Sound used to be a simple matter of beeps and boings, because that was all most computers could produce. With the growing use of digitized sound effects, musical backgrounds, and synthesized speech, the audio channel is an increasingly important part of the gaming experience. But game designers should always make it possible to turn the sound off, to avoid annoying the neighbors.

"User interface" is a composite of several factors, including screen layout, appropriateness of game controls, ease of learning, and quality of documentation.

"Overall value" is a highly subjective global rating, not an average of the other attributes. Part of "overall value" is a game's staying power—can you keep coming back to it with fresh enjoyment, or does it lose its charm once you figure out a few tricks? To rate as a Mikey

Award nominee, a game needs an overall value rating of 7, 8, or 9. These numbers are for comparison only; your mileage may differ.

This year I've revised the categories to focus more on the areas of interest that I can manage to follow closely. I play, review, and work with about a hundred new games a year. But the number of new titles published every month is so great that nobody with a real life could possibly cover the entire spectrum of computer entertainment.

1. Best War Game (Land)

V for Victory

Published by: Three-Sixty Pacific

2105 S. Bascom Avenue, Suite 380

Campbell, CA 95008

(408)879-9144

For: MS-DOS (386

and 4MB of RAM recommended)

List price: \$49.95

This huge simulation of the Normandy invasion

of June 1944 is detailed down to the battalion level and historically very accurate. The very clean game system is being adapted to provide a series of games on other WWII battles. Excellent manual. Needs some bug fixes, but this series promises to be a major delight for hardcore war gamers.



2. Best War Game (Sea)

Carriers at War

Designed by: Roger Keating and Ian Trout

Published by: Strategic Studies Group

8348 Monticello Drive

Pensacola, FL 32514

(904)494-9373

Fax (904)494-9374

For: MS-DOS (640K, EGA/VGA

graphics, supports AdLib or

Sound Blaster audio card,

mouse recommended); Macin-

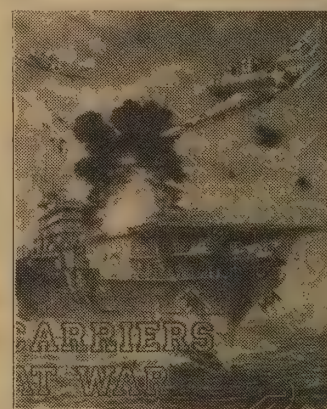
tosh and Amiga versions under

development

List price: \$69.95

Simulates the naval air battles of Pearl Harbor, Midway, The Coral

Sea, The Eastern Solomons, Santa Cruz, and The Philippine Sea, down to the level of an individual aircraft, bomb and gun salvo. Highly playable and bug-free, this game will gain additional staying power once the separate scenario editor is released.



3. Best War Game (Air)

Secret Weapons of the Luftwaffe

Published by: Lucasfilm Games

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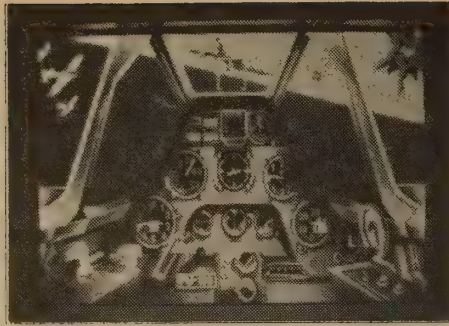
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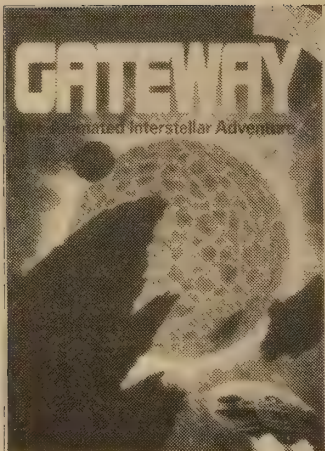
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San Rafael, CA 94912
(415)721-3300
For: MS-DOS
List price: \$69.95



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Distributed by: Accolade
5300 Stevens Creek Blvd.
San Jose, CA 95129
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For: MS-DOS
List price: \$59.95

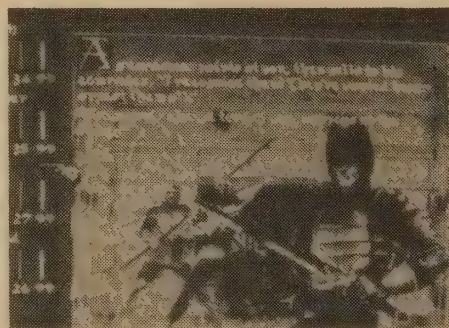


Based on the popular Frederic Pohl book of the same name, this graphic adventure proves that a great science fiction novel can be adapted into an intelligent, challenging, and playable game. Should be seen in 256-color Super VGA to be appreciated. Very clean mouse-driven user interface.

5. Best Adventure Game

Darklands
Designed by: Arnold Hendrick
Published by: MicroProse
180 Lakefront Drive
Hunt Valley, MD 21030
(410)771-1151
For: MS-DOS (640K, VGA graphics, mouse and audio card recommended)
List price: \$69.95

Real medieval history meets the sword-and-sorcery format. A huge, open-ended and richly textured exploration of Central Europe in the 15th century. The combat animation is blocky, and some of the action gets repetitious, but this will stand as a landmark in game design, especially when all the bugs are patched.



6. Best Educational Game

Zookeeper
Programmed by: Larene Wade Spitler
Published by: Davidson
PO Box 2961
Torrance, CA 90509
1-800-545-7677

For: MS-DOS (640K RAM, 8MB hard disk space, 12MHz 286 or faster CPU, VGA graphics and mouse required, most audio cards supported)

List price: \$59.95

Combines spectacular digitized animal photographs with an environmental message about habitats and endangered species. Guest review by my niece Lauren (fifth grade): "Thank you so much for the really cool game. I play it all the time. It's my favorite game. I'm already an Elephant Washer!!"



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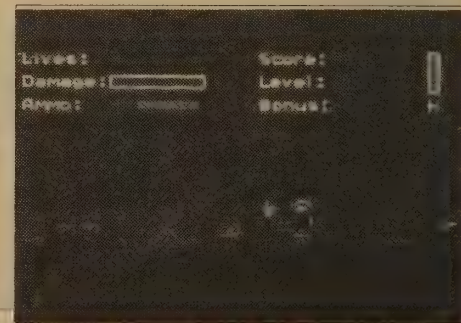
Hoyle Official Book of Games, Vol. 3
Published by: Sierra On-Line
PO Box 485
Coarsegold, CA 93614
1-800-326-6654
For: MS-DOS (640K, VGA/EGA)
List price: \$49.95

Backgammon, checkers, dominoes, Parchisi, and "Snakes and Ladders" all in one stylish, colorful package.

9. Best Arcade-Action game

Spectre
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PO Box 875
Palatine, IL
60078-0875
(708)991-0594
For: Macintosh
List price: \$59.95

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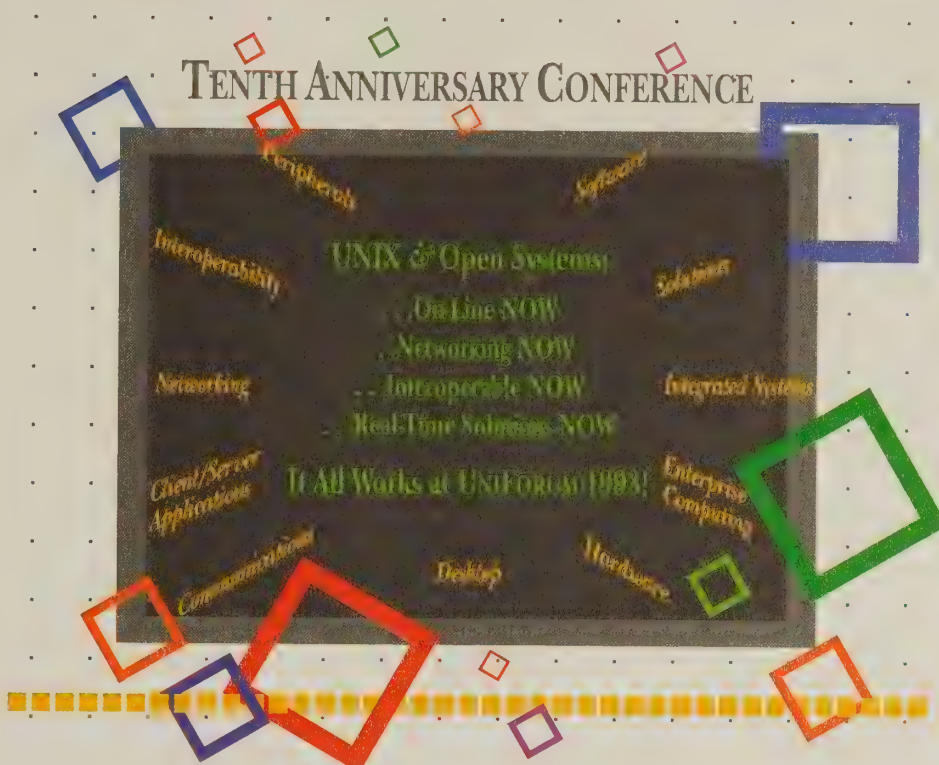
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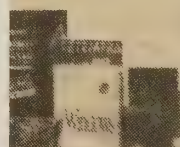
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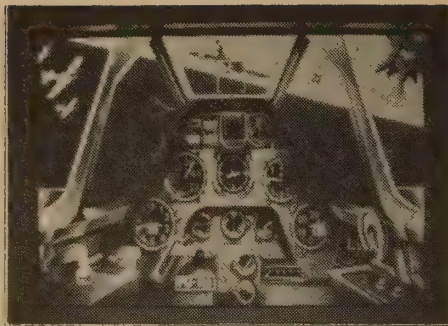
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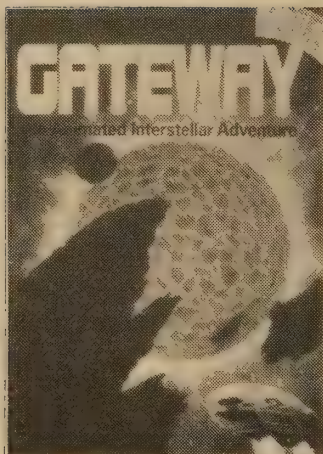


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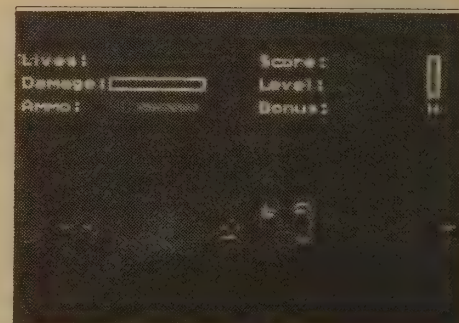
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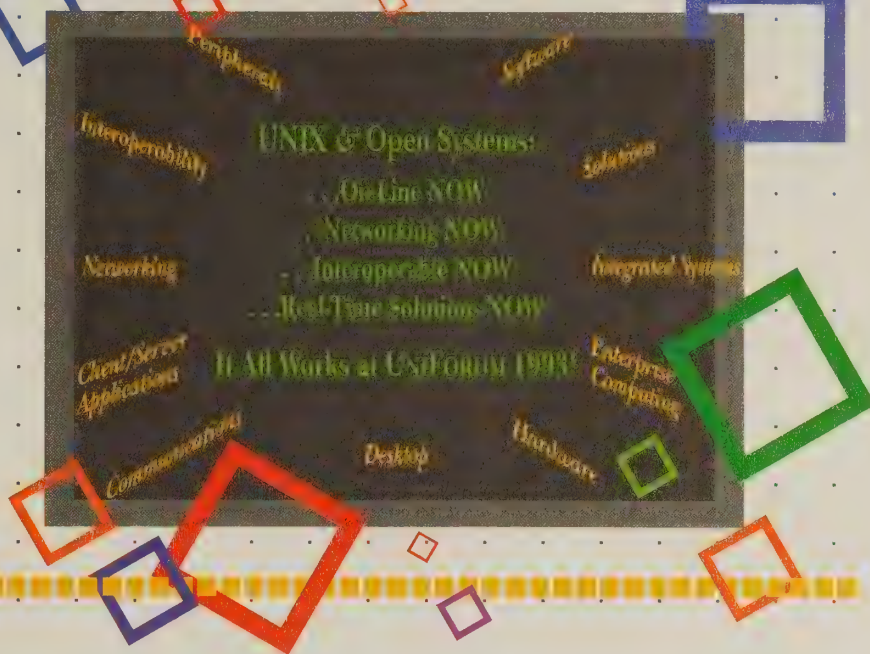
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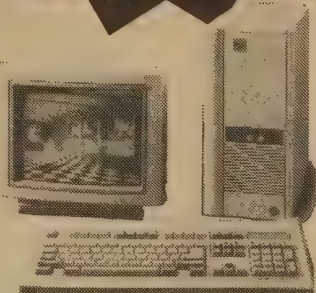
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HP Laser IIP+	785
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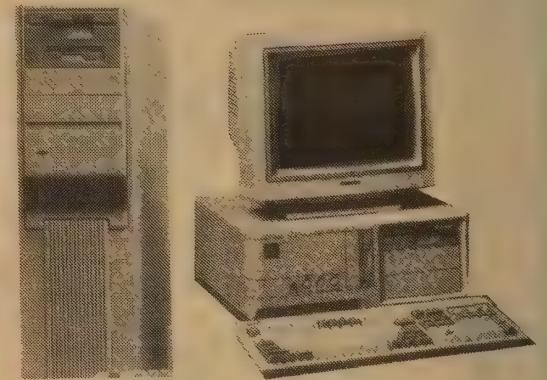


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486-33 EISA W/64K	628	793	1023	1229	1388	1478
486DX2-66 ISA W/64K	695	860	1090	1296	1455	1545
486-50 ISA W/64K	658	823	1053	1264	1423	1508
486-33 ISA W/64K	460	625	855	1066	1225	1310
486-33 W/64K CYRIX	385	550	780	985	1145	1235
486SX-25	225	390	620	826	985	1075
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386-33 W/64K	152	312	542	747	907	997
386-25DX	130	290	520	725	885	975
386SX-33	95	261	491	696	856	946
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2400 Int. Modem	34
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Window 3.1	38
DOS 5.0	38

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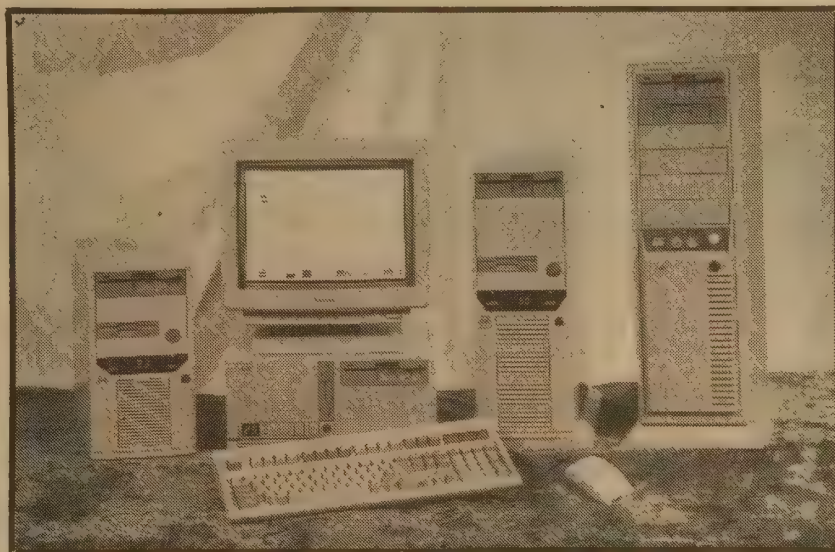


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AXIK'S COMPUTER SYSTEMS 486/WB-33



November 1992

"Axik may not be a household name, but its Ace Cache System is one of the best PC's we examined. It's the fastest 33 we tested, is one of the lowest prices we turned up. Service and support is another big plus, toll-free tech support line that works even on weekends. Every company starts small, if Axik keeps up the good work, household-name status could be just around the corner."

486DX-50

"In database server test, the Axik surpassed Dell, the previous leader, by 5 percent in transactions per minute (TPM). The AXIK was 4 percent faster than ALR. In the previous review, we attributed part of Dell's efficiency to its three-bay drive array. The Axik excels in this capacity with only one drive."

"The Axik ACE is a superior high-end file server with an extremely low price."

486DX2-50

"We liked the Axik more and more over time. Axik Computer's \$2,899 Ace Cache 486DX2-50 System minitower was a favorite among our lab testers, who loved its chassis design and couldn't get over its outrageously fast hard drive performance."

486DX-50

"A STATE-OF-THE-ART MOTHERBOARD ADDS SPEED"

"Solid components surround an advanced design that offers enhanced bus technology for future expansion. A low price is a bonus."

The 50 MHz 486DX system zips through applications with power and panache. And with the technologically enhanced and expandable motherboard, this system should satisfy your computing needs for years to come."

486DX-50

"AXIK 486-50 BEAT ALL OTHERS ON
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June 1992



July 1992



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July 1992



ACE CACHE
486WB-33

November 1992



PCComputing



486DX-50

"A GREAT BARGAIN"

"Axik Computers has gone to the trouble to build its own boards—and its home-grown ACE-motherboard-loaded tower system blows the competition out the door"

"RECORD TIMES"

"That's why we run our RealWorld Benchmark Tests twice on the Axik: we didn't believe the results the first time out. For the most part, the Axik's scores were among the lowest (that is, fastest) we've ever seen."

"Flat-out performance doesn't mean much if you're not getting value in other areas. The Axik 486WB/50 uses high-quality components like TEAC and Quantum drives, an Orchid VGA card, and a well-built roomy tower case. "All things considered the Axik at \$2,849 isn't just a good deal: It's a fantastic buy!"

486DX2-50

"IS ONE SPEEDY PC"

"The Axik Ace cache 486DX2-50 is one speedy PC, joining the top of the chart. This fairly compact tower has great internal accessibility, 6 slots free, and a generous 8 drive bays. Axik's baby motherboard includes a ZIF socket and a jumpered clock, which enables a 66-MHz 486DX2 migration."

The price adds more polish to the Axik's sheen. With an on-site service option, this fine PC would be an easy Best Buy! "On-Site Service Is Now Provided FREE!"

486DX-50

"You Can Have It All with the Ace 486/50"

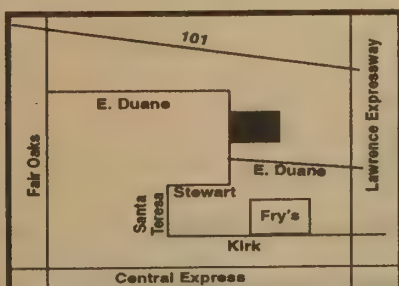
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"From the PC connoisseur's viewpoint the most interesting thing about the Axik is its motherboard. Axik makes its own boards, and the company's attention to detail shows"

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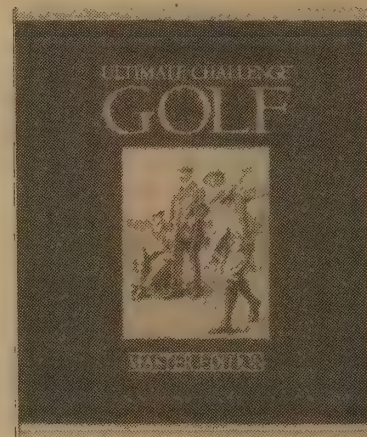
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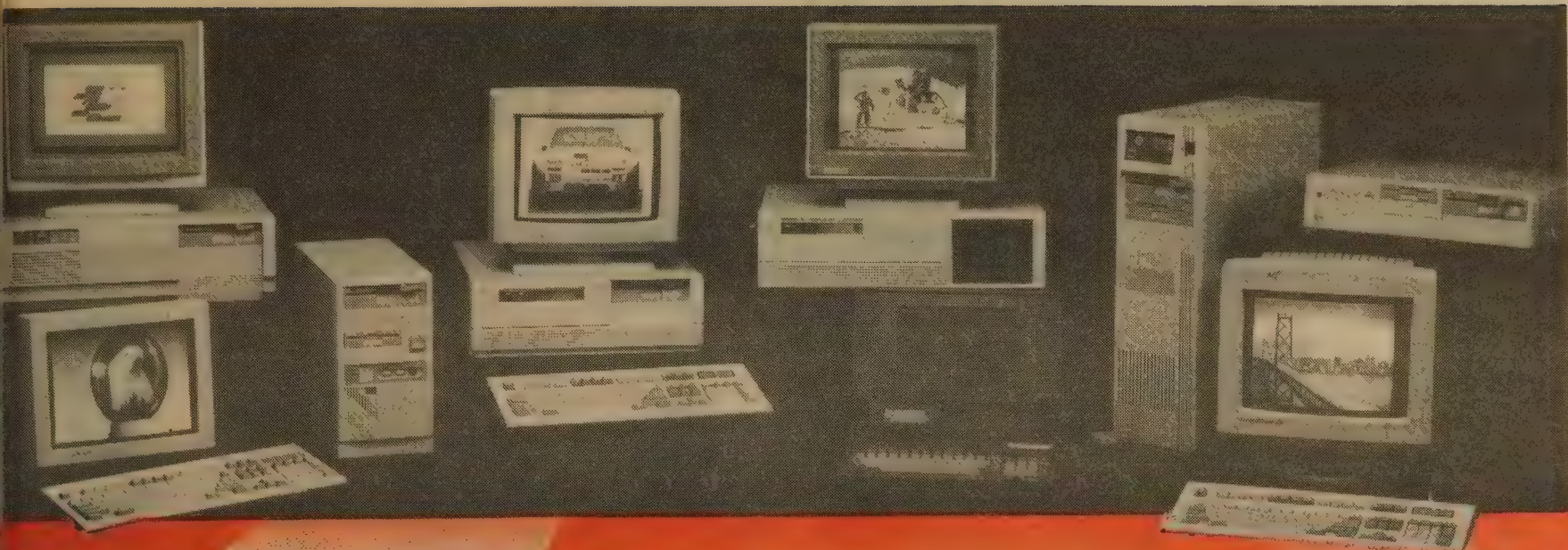
List price: \$59.95

A fifteen-year labor of love by brothers Bill and Bruce Bales, this is a detailed simulation of golf strategy



rather than exercise in precisely tapping the space bar. The accuracy, good design and rich variety of options in this game are enough to make you forgive the annoying keyboard copy protection.

We regret that this year's zero-based budget for the Mikey Awards rules out the gala award banquet and the hand-engraved crystal and-gold statuettes. In fact, this article is the only notification that the winners may receive, but they can all be proud of their achievements in Gaming Design.



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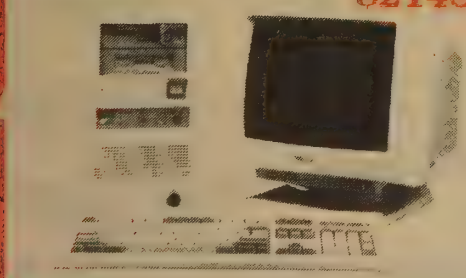
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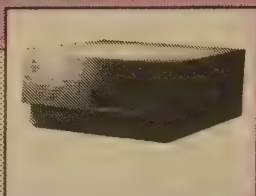
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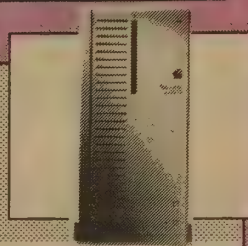


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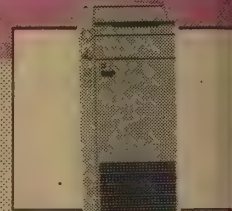


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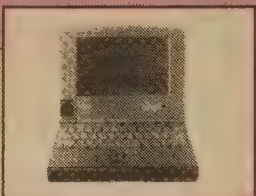
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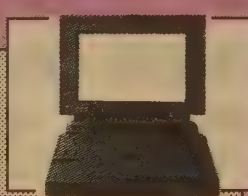
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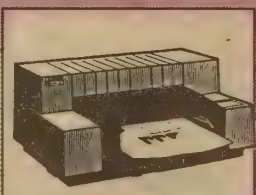


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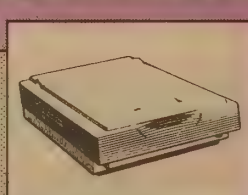


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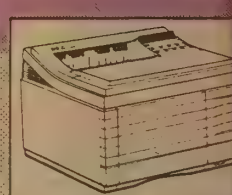


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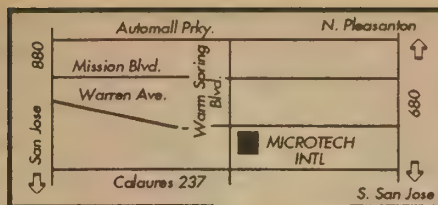
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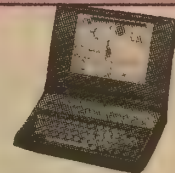
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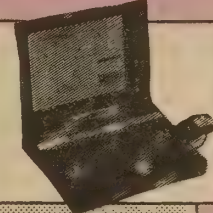


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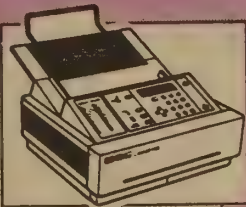
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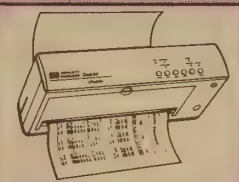
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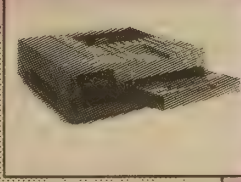


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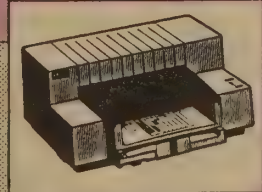


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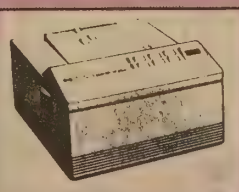
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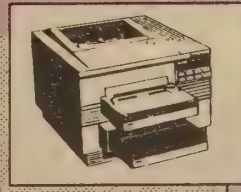
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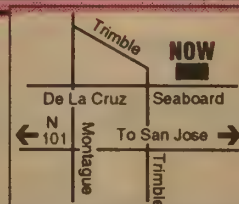
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MICROTIMES



Big Winners Of 1992: William H. Gates III, (above), Chairman and CEO of Microsoft; and Andrew S. Grove, President and CEO of Intel

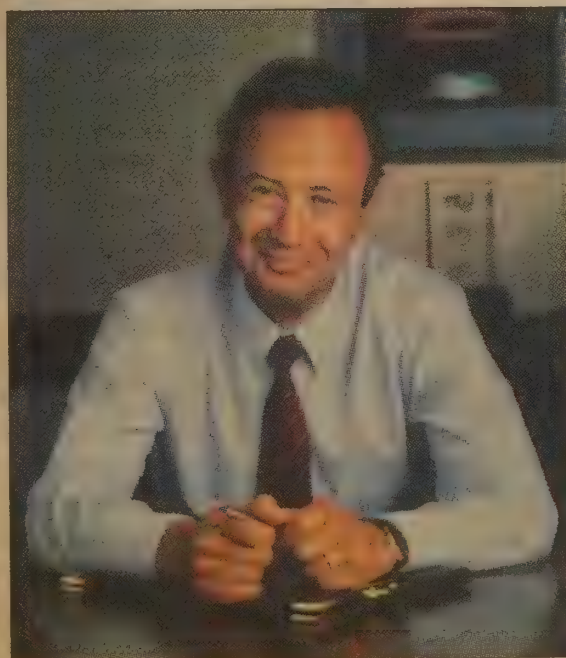


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The oft-repeated cliché about the industry in 1992 was that there were exactly two big winners: Microsoft and Intel. Like most clichés, this one's a bit of an oversimplification—Apple's billion dollars' worth of PowerBook sales are hard to ignore, for example—but few companies benefited more from the widespread adoption of Windows.

On most fronts, 1992 was a transitional year in the microcomputer company's evolution. While still popular, MS-DOS and the Mac operating system are in their twilight years, and any number of companies and consortia are scrambling to establish and exploit new OS standards to take advantage of ever-more-powerful hardware.

If history is any indication, the lion's share of that hardware will have Intel Inside. 1992 saw a host of vendors coming to terms with this reality: Sun, while insisting on the superiority of its RISC-based SPARC architecture, made sure it had an Intel version of its Solaris operating system. NeXT, historically a Motorola house for its own hardware, decided that the path to corporate acceptance lay with Intel, and announced that it was porting its object-oriented NeXTstep environment to the Intel architecture. IBM may have entered into an agreement with Apple to develop a new OS for the RS6000 chip, but for now, OS/2 runs on Intel.

Again, if history is any indication, what will probably be running on that hardware for the foreseeable future is some variant of Windows. Windows NT, due in early 1993, delivers UNIX-like power and has a clear compatibility/upgrade path from current DOS and Windows applications. But there's going to be a version of Windows for everybody—networked for workgroups, scaled down for pocket-sized wireless gadgets, pen-based for handwriting-input machines.

Not that Intel and Microsoft have worry-free lives. Intel has to deal with a variety of pesky competitors that make Intel-compatible chips and fill the inevitable holes in Intel's product line—486 chips that fit in a 386 socket, CPUs with low power requirements, etc. Intel spends a lot of time and money litigating with these competitors, picking a new, legally protectable name ("Pentium") for its next architecture, and generally trying to maintain its turf while innovating.

Microsoft, which is now bigger than General Motors, would appear to be in a more unassailable position—whereas software vendors used to whine that it was impossible to compete with Microsoft in the operating system arena, they're now complaining about similar difficulty with applications. One looming cloud on the horizon is the FTC's ongoing investigation of Microsoft, which some have speculated may result in a forced separation of its OS and application divisions. Borland's Philippe Kahn, whose company was dealt a severe blow recently when Microsoft went into the database business, has been heard to remark that gee, phone service got better and cheaper after AT&T was broken up, and...

Even if this never transpires, and Microsoft's competitors are

A YEAR OF TRANSITION

disappointed, a formidable array of companies from Novell to Sun to onetime ally IBM are scrambling to get technology and alliances in place to help them seize markets from Microsoft.

We'll see what happens. But in the meantime, a host of small companies, often startups, are finding lucrative niches unnoticed (for now, anyway) by the titans. A recent panel at the Technologic Partners PC Outlook conference was devoted to the theme of "Whatever happened to the software business?" subtitled "Can anybody besides Microsoft make money from Windows?" The answer, apparently, was a guarded "maybe," but T/Maker CEO Heidi Roizen offered an interesting insight.

For years, she said, T/Maker has been publishing an affordable, high-quality word processor for Macintosh, WriteNow. In 1992, they shipped its latest improved version. In the same year, they debuted a package called FaxMania, a variation on the ClickArt formula that lets faxmodem users send snazzy cover sheets with their faxes.

FaxMania, she says, is outselling WriteNow. By a considerable margin. Competing against MS Word is at best a struggle. Intellectual property, digital content, is the wave of the future.

Certainly with the long-awaited popularity of multimedia, content will be a critical element of tomorrow's computer industry. So will encryption. So will wireless communications. So will groupware.

A large number of people on this year's list are experiencing early success with these emerging technologies. Consider the list, and the year it represents, a preview of coming attractions.

Sheldon Adelson

Chairman and CEO
Interface Group

As computer-industry trade shows continue to proliferate at a stunning rate, Adelson's COMDEX, which engulfs Las Vegas each fall and has a major presence in other cities the rest of the year, just keeps getting bigger. Whether it's product announcements, demos, or general partying and schmoozing, COMDEX is the annual gathering place for the industry and shows no sign of losing momentum.



Alan Ashton

President

Bruce Bastian

Chairman

WordPerfect

A few months ago when we published our 100th issue and asked our writers to predict the state of the industry at the time of Issue #200, one of them suggested that WordPerfect would be to the '90s what WordStar had been to the '80s—i.e. a company that had blown its position of market domination by failing to respond quickly to



changing conditions. It was a fairly oft-expressed sentiment, particularly as WordPerfect was somewhat late in shipping a Windows product.

However, in the course of 1992 Ashton and Bastian (who have nearly exclusively owned the privately held company since they started it in 1978) have made it quite clear that they have no intention of heading down that infelicitous path. Longtime executive vice president Pete Peterson departed suddenly in March, and the two founders began a course of opening up the formerly insular company with, among other things, an alliance with Novell and the incorporation of Adobe's PostScript into its products. There are even rumors that the company may go public.

With its flagship product running on virtually every significant hardware platform, a strong presence in the growing workgroup market, and a customer support department that's the envy of every other company in the business, WordPerfect seems well positioned to parlay its existing advantages and new relationships into further success.

Carol Bartz

President, CEO, and Chairman
Autodesk

Recruited in April to succeed Autodesk's retiring CEO Alvar Green, former Sun vice president Bartz has effectively eliminated the slow decline into complacency that prompted founder John Walker to write the now-famous Information Letter #14. In her brief tenure so far, she's brought in strong management and positioned the company to expand its leadership in the increasingly competitive global CAD marketplace, notably with the formation of a new Mechanical division with the acquisition of Micro Engineering Solutions.



Steve Bass

Founder and President

Pasadena IBM PC Users Group

Reader Tom Lenzo recommended Bass to our attention for founding and leading this group so effectively. On seeking further info, we discovered that the now-huge user group, with 2,000 members and a wide variety of SIGs, arose from a classic instance of making lemonade when handed lemons.

In 1983, says Bass, he bought an IBM PC from a Large National Chain, and, when he asked for support, was told "don't use it in the shower." The next day, he founded the Pasadena group. In the late '80s, he also cofounded the Association of Personal Computer User Groups (APCUG), a nationwide organization serving user groups.

But wait, there's more. He's also a contributing editor with *PC World*, writing the Home Office column and editing the User Group Tips feature. He's also a syndicated newspaper columnist and the originator of what he terms "the allegedly humorous computer advice column, Dear Dr. DOS."

Daniel Ben-Horin

Director

CompuMentor

Ben-Horin founded CompuMentor to bring together the vast expertise of people working in the Bay Area computer industry with struggling nonprofit

organizations seeking help as they entered the digital age. Each year, CompuMentor dispatches hundreds of volunteers to help set up mailing lists, install networks, offer advice on software purchases, and generally reduce technophobia for a wide variety of nonprofits. In addition to growing into a significant organization itself, CompuMentor has served as the inspiration for several organizations across the country that seek to perform similar service in their communities.

Eric Benhamou

President and CEO

3Com

Benhamou has led 3Com through a traumatic turnaround, giving up its computer hardware and networking software operations to focus exclusively on networking hardware. His efforts have paid off in surging sales and profits for the company, as well as the development of what amounts to one-stop shopping for companies in need of complex special-purpose networking products.



Jim Bidzos

President

RSA Data Security

Until recently, encryption was a highly specialized field of little interest to the mainstream computer community. But with the advent of new technologies, from wireless (and thereby easy-to-intercept) communications to collaborative computing, it has become increasingly vital to ensure that messages originate with their stated authors and go only to intended recipients, and the formerly esoteric field has now assumed crucial importance.

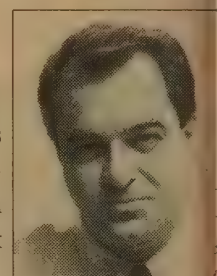
Founded by the three MIT professors who devised its proprietary encryption algorithm in 1977, RSA has grown under Bidzos's direction to the world leader in encryption technology, its products enjoying the status of de facto standards worldwide.

Despite some governmental opposition (rumor has it that the super-secret National Security Agency doesn't want the general public to have encryption it might not be able to break), RSA technology has already been licensed for current and future products by such diverse vendors as Lotus, Microsoft, Sun, Novell, DEC, Motorola, Northern Telecom, and Apple.

As data security assumes vital importance in the present and future computing needs of business and consumers, RSA is positioned as the leading player in this burgeoning market.

The Folks At BMUG

Going beyond its historical strength as the premier resource for Macintosh users, BMUG now offers service and support for Windows, UNIX, and other environments as well. It also offers services from software to T-shirts, and supports interest groups on subjects ranging from civil liberties to programming languages. It's a unique technical, cultural and social asset, and many of us in the computer world would be lost without it.



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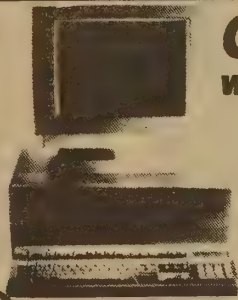
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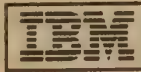
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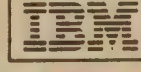
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Sheldon Breiner

President and Cofounder

Quorum

While RISC-based workstations are becoming increasingly attractive to current Macintosh users for their speed and power, the small selection and high prices of UNIX applications have been a powerful deterrent to the acceptance of such hardware in mainstream markets. At the same time, users with a heavy investment in Macintosh applications (and training) are generally reluctant to abandon that investment in order to get more powerful hardware.

Quorum offers an innovative twofold solution—Quorum Latitude, a tool that allows developers to quickly port their Mac applications to UNIX environments and give them the workstation's native GUI, and Quorum Equal, which lets users run unmodified Mac applications on Sun, Iris, and other workstations. Despite a few legal salvos from Apple in early 1992, it appears that Quorum is on solid and non-infringing ground with the product, and providing a clear Mac-to-workstation migration path that's a viable alternative to Microsoft.

"We are bringing the empowering wealth of personal computing to the raw power of RISC," said Breiner at the time of Quorum's rollout at 1992's Macworld Expo. At a time when Microsoft is exerting enormous pressure on Mac developers to port to Windows and NT, "Quorum's technology lowers the technical and economic barriers preventing Macintosh software developers from entering the emerging market for RISC-based computers."

Gordon Campbell

Chairman, President, and CEO

Chips and Technologies

With a longtime strategy of developing and marketing value-added, Intel-compatible chipsets, C&T has had its ups and downs in recent years. It appears to be back on track and positioned to take advantage of emerging growth markets, notably the palmtop and pen-based computer, with a full line of massively integrated silicon technology under development. The recently announced 8680 PC/CHIP, for instance, is expected to be a real boon to palmtop hardware vendors and customers, integrating in a single, low-cost chip all the features of a full PC except system memory.

Jim Cannavino

Vice President, IBM; and General Manager, IBM Personal Systems

IBM

Instrumental in both IBM's alliance with Apple and the severing of its relationship with Microsoft, resulting in the clear differentiation of OS/2 as an operating environment, Cannavino has been a central figure in IBM's recent redefinition of itself from complacent giant to an entrepreneurial, nimble, and forward-looking competitor.

One of his most visible accomplishments in the past year was the formation of IBM's Personal Computer Company, which announced a full range of technically innovative and competitively priced products in the fall.



Doug Carlston

Chairman and CEO

Brøderbund

"If you build your products properly, you can get products that last a long time on the market," says Carlston with fairly characteristic understatement. The perpetual hit Print Shop not only lives (in updated form), it's the foundation of an entire product line. Ditto the ubiquitous (if elusive) Carmen Sandiego, perhaps the only computer game character with her own TV show, whose educational adventures will shortly take her to outer space.

Reflecting the ongoing Brøderbund commitment to creating technically excellent and appealing products, the company inaugurated its first line of CD-only games, the Living Books series. The first entry, "Just Grandma and Me," is on its way to classic status.

After going public at the end of 1991, Brøderbund has continued to grow and prosper, and with the current boom in home computing, it is likely to continue along the same path.

Denise Caruso

Editor

Digital Media

As digital technology reaches into an ever-greater range of human activities, keeping track of the latest developments, from intellectual property law to compression standards, becomes at once overwhelming and vital. For insightful analysis of the current and future state of these matters, and what it means for vendors and consumers alike, Caruso's newsletter provides a state-of-the-art (albeit print-format) resource.



Steve Case

President

America Online

Events of 1992 proved the validity of Case's vision—make online services fun, easy to use, and affordable, and people will flock to them. After its successful public stock offering in March, the company continued to report satisfying increases in revenue while continually enhancing the quality and variety of its product, from services like an Internet mail gateway to online gathering places cocreated with vendors like Microsoft and the *Chicago Tribune*. At year's end, AOL announced another emerging market—an agreement to license its technology to Apple for the latter's future online services. The agreement is expected to be followed by similar arrangements with other vendors.



Barbara Cass

Executive Director

Software Entrepreneurs Forum

Every year this Palo Alto organization adds more SIGs and resources, designed to help its membership of fledgling and established software developers and consultants succeed in a complex and



rapidly changing marketplace. Cass and her small staff have dealt with the daily challenges of a growing and diverse association and made it all run smoothly and effectively.

Ed Catmull

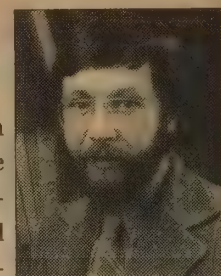
President

Pixar

Defining the changing mission of Pixar, founded in 1979 as the Computer Division of Lucasfilm, Catmull says, "Our goal was to make images so realistic that they could be used in live-action motion pictures. Now, we make the tools and systems that will let thousands of people create photorealistic pictures of whatever they choose to design."

Pixar's RenderMan technology is the centerpiece of its spectacular graphics capabilities, and it's becoming more widely available on an increasing number of hardware platforms, from UNIX workstations to Macintosh, with the shipment of MacRenderman in 1992.

Meanwhile, on another front, Pixar's animation technology achieved new milestones, notably the combination of Pixar-generated images with the traditional animation of *Beauty and the Beast*. The evolving Disney/Pixar relationship promises great things for animated films in the future.



Winston Chen

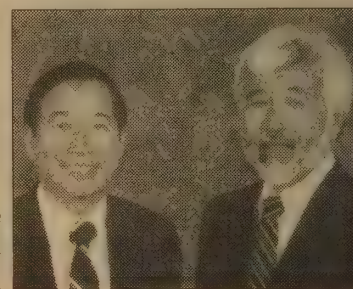
Chairman

Ko Nishimura

President and CEO

Solectron

With a corporate culture that emphasizes and rewards a sense of individual employee responsibility for the quality of the product, and a low defect rate that's the envy of the industry, Baldrige Award winner Solectron stands as sterling proof that US high-tech manufacturing isn't quite as dead as it's reputed to be. The company, which manufactures components for such clients as Sun, Apple, and Hewlett-Packard, has exported its manufacturing expertise to plants in Europe and Asia, and recently opened an office in Japan to cultivate relationships with Japanese customers and suppliers.



Jim Clark

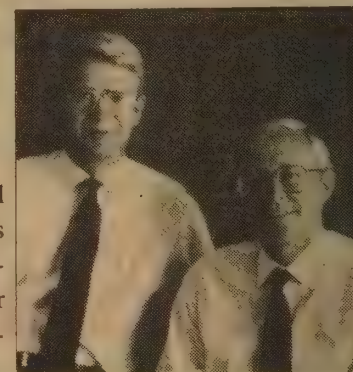
Chairman

Ed McCracken

President and CEO

Silicon Graphics

The unchallenged leaders in graphics workstations continued to deliver high-performance hardware, notably the awesome Reality Engine, shipped in 1992. Meanwhile, they took further steps to make their Iris hardware an attractive upgrade path to Mac and PC users by dropping prices, increasing performance, and entering into strategic agreements with vendors like Quorum and Insignia Solutions to let PC and Mac users run their existing software on SGI hardware, while taking advantage of



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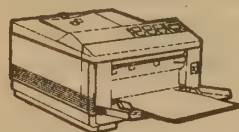
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*101-key Keyboard

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the Iris's superior graphics and multimedia capabilities.

Scott Cook

President and CEO

Intuit

Intuit's mission of automating home and small business financial transactions was right on target for one of the industry's major growth areas.

While its check-handling Quicken product remains a runaway bestseller and enjoys new popularity with the increased acceptance of home banking service, the company innovates on other fronts, with programs for incorporating credit card transactions into Quicken files, handling small-business payroll needs, and creating invoices for professional and service-based businesses.

William Davidow

General Partner

Mohr Davidow Ventures

Intel veteran and longtime venture capitalist Davidow is one of the industry's most astute observers. His 1992 book *The Virtual Corporation* (co-authored with Michael Malone) provides shrewd common-sense analysis of changing markets and business climates worldwide, and the cultural and organizational changes facing US business in general and the high-tech industry in particular if they wish to remain competitive in a world of smart workforces and just-in-time manufacturing.

Jan Davidson

President

Davidson & Associates

Davidson continued to delight children and teachers and provide a tough act to follow for the educational software community with dynamic, effective programs, from Math Blaster to the new, critically acclaimed English Express multimedia-based ESL package.

Paul Dean

Cofounder and CEO

Pyramid Data Inc.

Another of this year's up-and-coming entrepreneurs positioned to serve emerging markets is Dean, whose inspiration is an integrated product suite of office automation/groupware applications called PowerOffice! While Dean and his small staff (and outside consultants, one of whom has created a specialized real estate module) work on expanding the product line, they're achieving early success with the first of the PowerOffice! applications, PowerLeads!, a full-featured, Windows-based contact management program.

Michael Dell

Chairman and CEO

Dell Computer

With increasing presence in the retail and VAR channel, Dell has come a long way from its roots as an upstart mail-order business in its founder's



dorm room. But, while facing challenges from the newly price-competitive Compaq as well as a plethora of mail-order vendors, Dell has managed to keep his company successful in a changing market, building new alliances and support channels while continually reducing operating costs.

James Dionne

President and General Manager

Commodore

Historically, Commodore has always seemed blessed with a great machine (in the Amiga) and devoted users—and cursed with a nearly frightening inability to capitalize on these assets. For the past few years, the Amiga has languished to the point where many devotees reluctantly abandoned the platform and the company's marketing seemed most skillful at creating new feet in which to shoot itself.

However, the release of the long-awaited Amiga 4000 may change all that. It delivers excellent multitasking and multimedia capabilities with a great price/performance ratio, and, as the profit margins erode in the PC clone marketplace, Dionne hopes to induce more dealers to offer his product line. It's too soon to tell how well the new machine and strategy will pay off, but Amiga watchers are generally more upbeat than they've been since the advent of the Video Toaster.

Brian Dougherty

Chairman and CEO

GeoWorks

Starting with software that gave Commodore 64s and Apple IIs GUI capabilities their creators never intended, and continuing through the current success of GeoWorks, which lets even an XT do windows, Dougherty's exhibited a talent for making small better.

Which, of course, makes it a natural that GeoWorks is making major inroads into what it's calling Consumer Computing Devices. And not surprising that when Tandy and Casio formed a joint venture to develop these devices, they decided on a pen-based operating system from GeoWorks.

Eric Drexler

Research Fellow

Institute of Molecular Manufacturing

Author of *Engines of Creation* and, most recently, the textbook-level *Nanosystems*, Drexler has worked since his undergraduate days to increase understanding of emerging possibilities in nanotechnology, the science of manipulating matter at the molecular level. While most currently envisioned applications may still be decades away, the technology offers seemingly limitless possibilities for good and ill, from tiny supercomputers to biological warfare, and Drexler is a leading force for promoting understanding of the technology for its wise and beneficial use.

John C. Dvorak

Columnist

For someone who's apparently spent much of the year being abducted by aliens and observing bizarre events in the parallel-universe counterpart of Microsoft, Dvorak has man-



aged to continue his prodigious output of information and opinion and delight his fans with ubiquitous columns, syndicated radio shows, and an ever-growing series of Dvorak's Guide books.

Esther Dyson

President

EdVenture Holdings

Dyson's insight is one of high-tech's greatest assets. Involved in the computer industry at a multiplicity of levels, she's the editor and publisher of the highly regarded *Release 1.0* and *RelEast* newsletters, which offer intelligent and hype-free analysis of trends and opportunities in the technology industry, in the US and in the emerging former-Soviet-bloc countries. Her organization produces an annual conference in Prague that's centered around the nascent technology in Eastern Europe.

Dyson is also a limited partner in the Mayfield Software Fund, part of one of the most well established venture capital firms in the business, and serves on several technological advisory boards.

Larry Ellison

President and CEO

Oracle

Borland and Microsoft may be preparing for a major database slugfest on the PC, but they're both talking about how well their software works with Oracle.

Founder Ellison has done a spectacular job of keeping the company on a constant path of beating its own best figures. At the same time, after the first-ever losses and ensuing management shake-up of 1990, he's made some necessary changes in the company's culture, reducing its dependence on its hard-driving direct sales force and moving the product into the dealer and VAR channel.

Meanwhile, his policy of porting the software to every significant operating environment from mainframe to Macintosh—continues to pay off, with, for example, the only 32-bit relational database software that runs under OS/2.

Doug Engelbart

Director

Bootstrap Institute

"Collaborative computing" may be the emerging buzzword du jour, but most of what the industry's only beginning to grapple with, Doug Engelbart saw quite clearly decades ago. From 1959 to 1977 he directed SRI's Augmentation Research Center and developed the NLS system, which incorporated such Engelbart brainchildren as the mouse, display editing, windows, hypermedia, groupware, and shared-screen teleconferencing.

But after years of coming to terms with small bits and pieces of Engelbart's vision, the computer industry seems more ready to deal with its broader applications—at 1992's Groupware Conference, Engelbart got a rousing ovation when he announced that if people still weren't ready to embrace his ideas, well, he was ready to keep talking about them for another 20 years if necessary.

Engelbart's current work at Bootstrap (presently housed at Logitech, where they've done rather well in the mouse business) involves building a consor-



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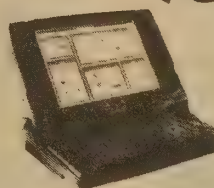
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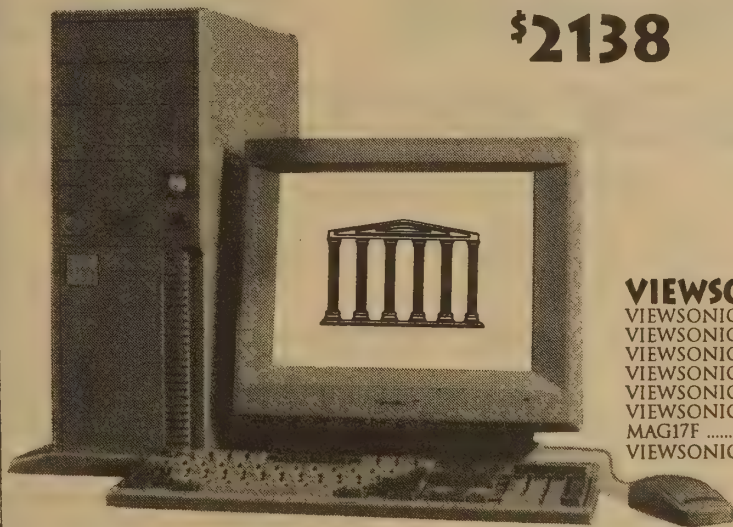


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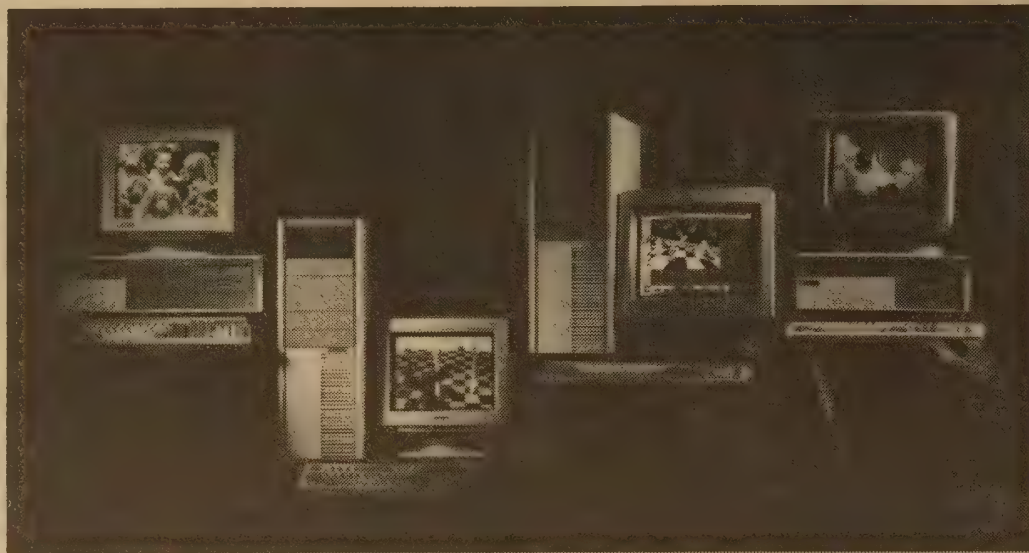
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tium of industry and government partners to develop and implement a system for advanced cooperative work. With the world apparently finally ready for groupware, expect Engelbart to play a vital role.

Mark Eppley

Chairman and CEO

Traveling Software

Since founding Traveling Software in 1982, supporting such emerging markets as the Radio Shack Model 100, Eppley has had a clear sense of the importance of portable computing and its relationship to the desktop—and capitalized on its unique user requirements with such products as LapLink.

Now, however, Eppley believes, a fundamental paradigm shift is at hand. "The extended office will give rise to a new way of using computers, one that will allow users to have a computer device with them at all times. The emergence of the extended office will require the confluence of a number of technologies, not the least of which will deal with moving information from one place to another by a variety of channels, many of which are not commonly used today.

"The key to the communications-centric computers of the 1990s will be miniaturization and portability. By the end of the decade, many workers will own several computers that perform various specialized functions. But, unlike previous computing paradigms, the 1990s will be an era when all of these devices from the smallest handheld 'pad' to a powerful desktop workstation will be linked, allowing instant access to information."

Eppley has worked to position his company to take advantage of this shift, not only by extending the LapLink product to platforms including the Casio B.O.S.S. but by entering into OEM agreements with a host of hardware vendors from Apple (with Newton, the first platform to incorporate Traveling Software's Universal Communication Object technology for cross-platform file exchange) to WordStar.

Amnon Even-Kesef

President and Co-founder

ASP

ASP is a classic example of the Silicon Valley startup that succeeds by finding solutions for a specialized but common problem—in this case, low-cost printer sharing, easily done with Macs but a real problem with PCs. Even-Kesef spearheads the company's development and marketing efforts, which have resulted in a full-featured line of plug-and-play printer-sharing products for standalone and networked environments, and in global, multichannel sales to customers from OEMs to end-users. As a result, the company is generally recognized as the leader in its well-defined market.

David, John, and Randy Fry

Kathryn Kolder

Fry's Electronics

The Fry Bros. expanded their culturally unique superstore chain into Southern California in 1992, enabling Southland as well as Silicon Valley techs



to engage in one-stop shopping for all their computing and junk-food needs. Meanwhile, general manager Ms. Kolder added to her hectic schedule by serving as an insightful participant in industry panels trying to come to terms with such issues as the convergence of the personal computer industry with consumer electronics.

Bill Gates

Chairman and CEO

Microsoft

Clearly, one of 1992's big winners. (See introduction)

John Gilmore

Renowned programmer Gilmore has cofounded several organizations over the years, including EFF and Cygnus Support, that relate to various aspects of public access to information. In the case of Cygnus, its staff has made a growing and successful business by offering paid support services to government and corporate users of free UNIX software.

Probably his most noteworthy accomplishment came at year's end, when, as part of his ongoing effort to secure access to government text on cryptography (technology of growing importance for corporate and private communications), he came into conflict with the National Security Agency. It seems that seventeen years ago some significant but aging cryptography texts had been declassified and made publicly available, even ending up on the shelves of public libraries. For somewhat mysterious reasons, the documents were reclassified during the Reagan administration, but a few texts remained in the libraries, where Gilmore found and copied them.

When, as part of a larger FOIA action to access government crypto documents, he let it be known that he had these books and sought clarification of their status, he was briefly threatened with prison and other dire legal action by the NSA, which said that general access to the documents would make its eavesdropping efforts more difficult. After several days of intense press interest in the matter, however, the NSA backed down and decided to reclassify the documents, opening the door to improved private-sector aspects to cryptographic research and tools.

Nat Goldhaber

CEO

Kaleida Labs

Goldhaber's penchant for connectivity entered a new dimension with his arrival at Kaleida, the multimedia-technology joint venture between Apple and IBM. As he told John Perry Barlow in our cover story in Issue #102, "This is absolutely mind-bogglingly mischievous, because it affects virtually all of the power centers and all of the economic centers in this country today, period. And if it's done right, it has a remarkably democratizing effect, a remarkably empowering effect, on people who are fundamentally disenfranchised right now, for whatever reason."

We look forward to his and Kaleida's subversive exploits with glee.



Joe Gradecki

Publisher

PCVR

Michael Conduris of San Francisco's VR Institute recommends Gradecki for this year's list for his work in publishing the PCVR journal, which serves as a valuable resource for virtual reality pioneers, especially cash-strapped ones.

Says Conduris, "The magazine has helped countless people harness the power of homebrew virtual reality. [Gradecki] has demonstrated that networked virtual reality over the Internet is possible; he helps you create a homebrew VR helmet, and shows you how to build a head tracking device for under \$10. He is also very helpful over the phone with people trying to learn about this technology."

Steve Greenburg

President

Golden Gate Computer Society

A reader identified only as W.J. praised Greenburg highly and earnestly recommended that we add him to this year's list in recognition of his effective work with GGCS. Not only has Greenburg provided useful resource to current computer users, says W.J., "He's done a great deal of good in bringing new people into the computer arena."

So, in happy concurrence with W.J., we're happy to salute Greenburg for his user support and expansion of the computer community.

Andrew S. Grove

President and CEO

Intel

In a year of emerging markets and confusing transition between standards, the reign of Intel shows no sign of ending (see introduction).

William F.X. Grubb

President and CEO

The Complete PC

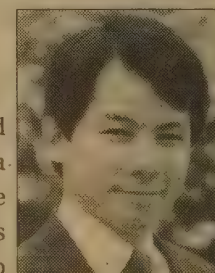
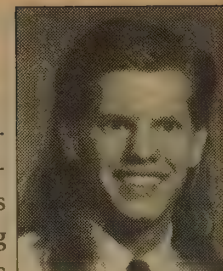
Grubb, who in a previous life was the founder and president of one-time game publisher Imagic, has led The Complete PC to a leadership position in the area of business communications, with such products as scanners and fax modems. Beginning with some of the industry's earliest voicemail and fax accessories for PCs, the company now offers a sophisticated array of products with wide acceptance. Its most recent innovation, The Complete Communicator series, integrates modem, fax, scanner, and voicemail features on a single affordable board, and is a hit with both corporate and individual users.

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Founder

Alliance Forum

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3COM 3C503-16 ETHERLINK II 5 Pack	738
3COM 3C523B ETHERLINK/MC	290
3COM 3C523B ETHERLINK/MC 5 Pack	1,278
3COM 3C507 16-BIT ETHERLINK	304
3COM 3C507 5 Pack, (1 Doc/Drivers)	1,347
3COM 3C509 ETHERLINK III 16-bit	160
3COM 3C509 ETHERLINK III 5-Pack	699
INTEL ETHEREXPRESS 16	135
INTEL ETHEREXPRESS 16 MCA	176
INTEL ETHEREXPRESS 16 5 Pack (1 Doc/Drivers)	625
INTEL ETHEREXPRESS 16 20 Pack (1 Doc/Drivers)	2,007
NOVELL/EAGLE NE2000 16-Bit	139
NOVELL/EAGLE NE2/2C 16-bit Micro Channel	253
SMC ETHERCARD ELITE 16 Coax	144
SMC ETHERCARD ELITE 16 Coax 6 Pack	788
SMC ETHERCARD ELITE/A FOR PS/2	221
3COM 3C579 32-bit EISA Coax	299
3COM 3C579 32-bit EISA Coax 5-pack	1,150
ACCTON 32-Bit EISA Coax/10BaseT Combo	450
EXOS/MICRODYNE 32-BIT EISA	625
INTEL ETHEREXPRESS 32-Bit EISA	580
NOVELL/EAGLE NE3200 32-Bit EISA	711
NOVELL/EAGLE NE2/32C 32-Bit MC	543

Token Ring

3COM TOKENLINK III 16/4 ISA	474
3COM TOKENLINK III 16/4 EISA	746
IBM TOKENLINK RING ADAPTER 16/4	615
INTEL TOKENEXPRESS EISA 16/4	698
MADGE SMART RINGNODE Adapter 16/4	621
MADGE TOKEN RINGNODE Adapter 16/4 EISA	850

10 Base-T Twisted Pair Ethernet

HTI 10 Base-T transceiver (AUI to RJ45)	89
ACCTON 10 Base-T transceiver (AUI to RJ45)	100
RACAL 10 Base-T transceiver (AUI to RJ45)	110
HTI 10 Base-T 16-bit Ethernet Adapter	125
3COM 3C503-16TP ETHERLINK II 16 16-bit	209
3COM 3C503-16TP ETHERLINK II 16 5PK	825
3COM 3C507 ETHERLINK 16-bit TP	340
3COM 3C507 ETHERLINK 16-bit TP 5PK	1,394
3COM 3C509-TP ETHERLINK III 16-bit	170
3COM 3C509-TP ETHERLINK III 16-bit 5-pack	699
3COM 3C523B 10 Base-T MC	337
3COM 3C523B 10 Base-T MC 5 Pack	1,517
ACCTON EN1640 ETHERCOMBO 16-Bit	175
INTEL ETHEREXPRESS 16 TP	145
INTEL ETHEREXPRESS 16 TP MCA	186
INTEL ETHEREXPRESS 16 TP 5 Pack	625
SMC ETHERCARD ELITE 16T 10 Base-T	144
SMC ETHERCARD ELITE 16T 10 Base-T 6 Pack	799
SMC ETHERCARD ELITE 16 COMBO	177
SMC ETHERCARD ELITE 16 COMBO 6 Pack	984
3COM 3C579 ETHERLINK III EISA 10BaseT	299
3COM 3C579 ETHERLINK III EISA 10BT 5-pk	1,150

External/Pocket Adapters

DLINK Pocket Ethernet Adapter BNC	250
DLINK Pocket 10 Base-T Adapter	250
HTI Ext. Ethernet Adapter w/ Parallel Port	199
HTI Ext. 10 Base-T Adapter w/ Parallel Port	199
XIRCUM Pocket Arcnet Adapter COAX	267
External Ethernet Adapter	413
External Token Ring Adapter	649
Pocket 16/4 Mbps TR Adapter	615
Pocket Ethernet II BNC	345
Pocket Ethernet Adapter 10 Base-T	378

10 Base-T Concentrators

ASANTE 8-Port Concentrator	299
ASANTE 1012 12-Port Smart Hub	820
ASANTE 1701 Smart Hub 2-port w/SMNP module	966
EAGLE 4-port Hublet Mini-Repeater	228
HTI 12-port 10 Base-T Concentrator	525
EXOS/MICRODYNE 16 port 10 Base-T Concentrator	621
INTEL Int. EtherExpress TPE Hub/ISA (12 ports)	565
INTEL Int. EtherExpress TPE Hub/EISA (12 ports)	641
INTEL Hub Expansion Board (12 add'l ports)	490
INTEL Harmonica for EtherExpress TPE Hub	65

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Host 10BaseT Module	1,234
Smart 10 BaseT Module	1,791
EtherManager Software	1,234
SYNOPTICS 2803 16-Port w/AUI	914
2804 16-Port Concentrator w/FO	1,124
2813-03 10Base-T Conc. w/AUI(Basic)	1,623
2813-04 10Base-T Conc. w/AUI(Adv.)	2,047
2814-03 10Base-T Conc. w/FO (Basic)	1,834
2814-04 10Base-T Conc. w/FO(Adv.)	2,259
Adv. Ethernet/TR Control Console SW	2,621

Repeaters

ACCTON EtherRepeater 2 AUI/2 BNC	685
IMC LANextender BNC/BNC-limited to 1 per lan	325
IMC Dual Port Ethernet Repeater BNC/BNC	492
IMC Quad Port Repeater	600
IMC Multi-Port Repeater Chassis	568
IMC BNC Repeater Card for IMC Multi-Port Repeater	253
IMC 10BT Repeater Card for IMC Multi-Port Repeater	135

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BRIGHTWORKS PS-Print (Software)	276
CASTELLE JETPRESS BNC/10 Base-T	436
FRESH TECH Printer Assist (Software)	175
INTEL LANSpool Print Server NLM (Software)	449
INTEL NETPORT II for Ethernet	529
INTEL NETPORT II for 10 Base-T	529
INTEL NETPORT II for Token Ring	760

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APC POWERCHUTE PLUS for Novell (VAP/NLM)	99
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APC SMART-UPS 2000	1,294
ELGAR IPX1100SL (1000w)	539

Network Fax

CHEYENNE FaxServe VAP/NLM	679
OPTUS FACSys NetWare Fax Server Software	651
INTEL Satisfaxtion Modem 200	317
INTEL Net Satisfaxtion Software	1,040
JETFAX II 9250 w/1 MB	569
JETFAX II 9450 w/4 MB	975

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TJ-10 120MB TRAKKER Parallel Port Tape Drive	395
TJ-20 250MB TRAKKER Parallel Port Tape Drive	479
PT-25 2GB SCSI Tape Drive w/Ctrl	1,110
PT-50 4GB SCSI Tape Drive w/Ctrl	1,725
TALLGRASS FILESECURE 500i (500MB)	1,058
FILESECURE 1000i (1GB)	1,599
FILESECURE 1300i (2.6GB)	2,399
MOUNTAIN FS1200 2.0GB Int. 4MM, SCSI	2,915
MOUNTAIN FS1200 2.0GB Ext. 4MM, SCSI	3,207

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ARCHIVE INT. PYTHON 2GB DAT w/NLM	2,051
ARCHIVE EXT. PYTHON 2GB DAT w/NLM	2,177
ARCHIVE INT. PYTHON 4 GB DAT w/NLM	2,849
ARCHIVE EXT. PYTHON 4 GB DAT w/NLM	2,975
EXABYTE INT 2.2 GB 8MM w/NLM	2,744
EXABYTE EXT. 2.2 GB 8MM w/NLM	2,870

MacIntosh Products

ASANTE MC+HIE64 Coax/MAC II	158
ASANTE MC+HIE64 10 BaseT/MAC II	158
ASANTE MC+30iE64 Coax/IIxi & SE/30	158
ASANTE MC+30iE64 10 BaseT/IIxi & SE/30	158
ASANTE EN/SCPB Thick/Thin/10BT for Powerbook	346
ASANTE EN/SC10TPB 10BaseT for Powerbook	283

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RJ-45 Crimper	75
RG58 Ethernet BNC-Crimp (100 pak)	125
RG62 Arcnet BNC-Crimp (100 pak)	125
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BELDEN PVC RG58 or RG62 Cable (1000' min)	175
PLENUM RG58 or RG62 Cable (1000' min)	350

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MICROTEST Ethernet LANModem	1,509
MICROTEST Token Ring LANModem	1,965
U.S. ROBOTICS Modem Sharing Kit V32BIS	635
U.S. ROBOTICS Dual Modem Sharing Kit	1,018
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OS/2 Platform	344
WINDOWS Platform	344
MacIntosh Platform	344
10 USERS license	240
25 USERS license	587
100 USERS license	2,287

Network Utilities

CHEYENNE Monitrix Network Mgmt.	595
Utils for NetWare 286/386	262
ARCserve NLM V4.0 (up to 5 users)	273
ARCserve NLM V4.0 (up to 20 users)	810
ARCserve NLM V4.0 (up to 50 users)	1,018
ARCserve NLM V4.0 (up to 250 users)	1,295
ARCserve Solo	185
DIRECT ACCESS Network Menu	366
FRYE UTILITIES NetWare Management v1.1	324
Early Warning System v1.1	324
Lan Directory v1.1	278
XTREE XTNET Network File Manager	305

Peer-to Peer Networking

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AE-2 Starter Kit	498
AE-3 Starter Kit	579
Novell NetWare Lite 1.1	70
NetWare Lite coax starter kit (2 Stations)	420
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MS - 4123.....\$110
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MS - 3121\$108
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MS - 4123 VL (VESA Local Bus)
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MS -4118.....\$199
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TSENG 0 wait w/1MB 256/64K....\$82/89
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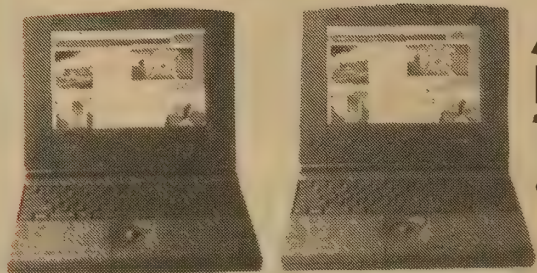
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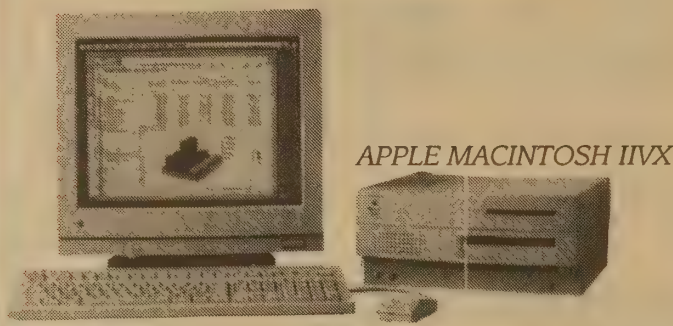
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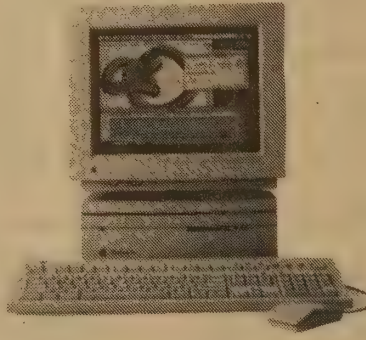
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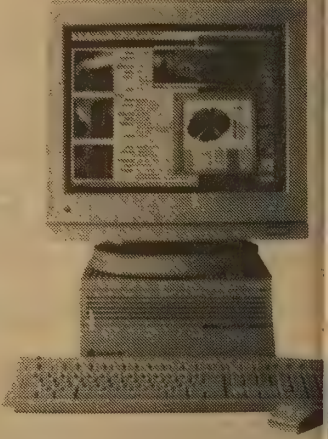
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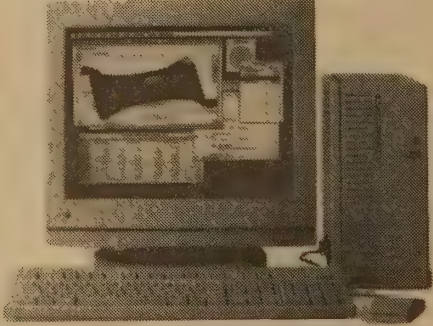


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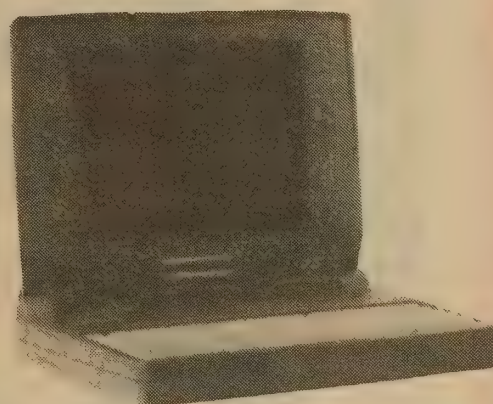


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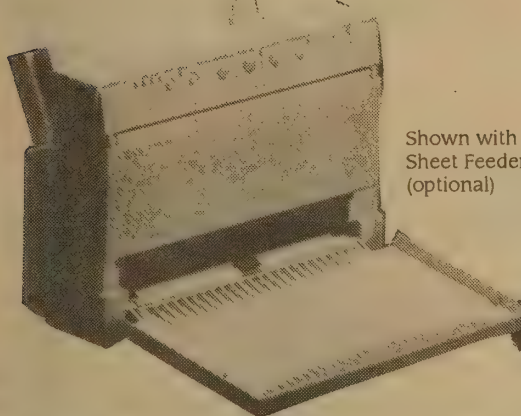


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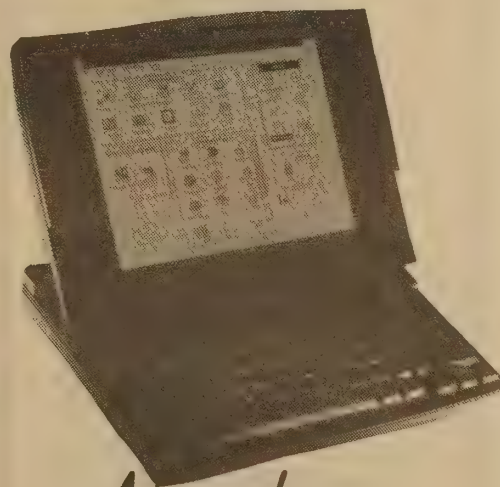


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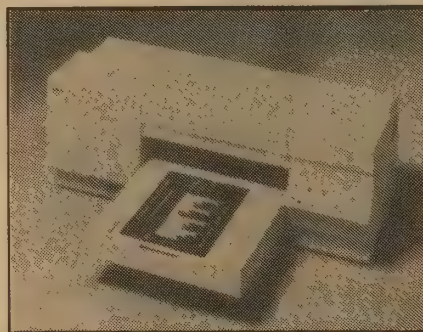
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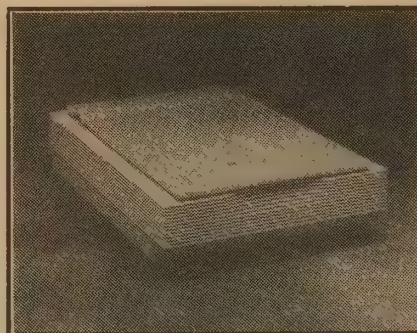


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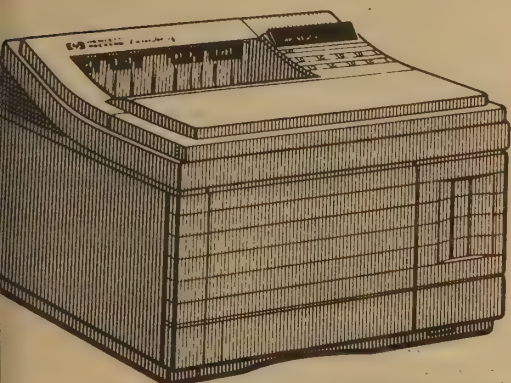
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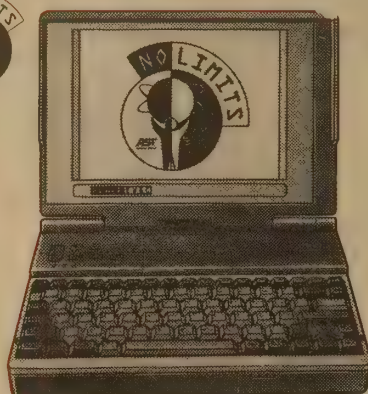
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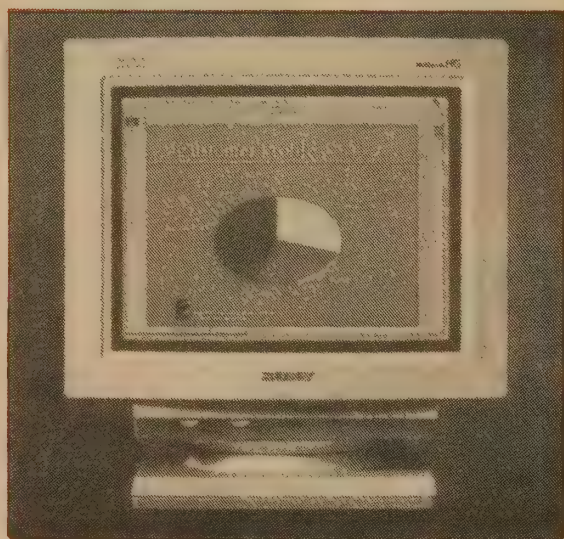
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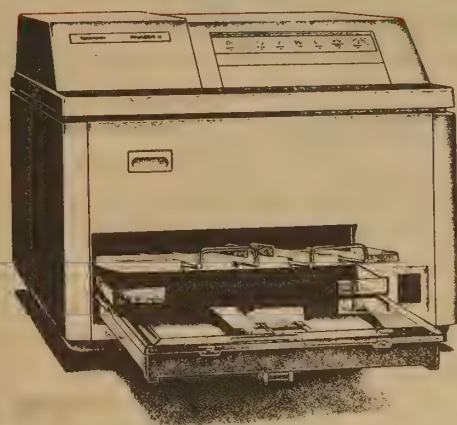
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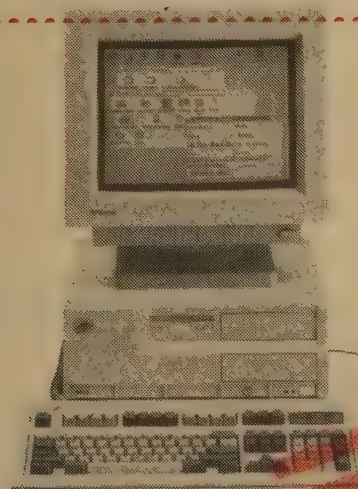
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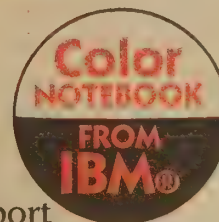
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Tom Hayes

Chairperson

Joint Venture: Silicon Valley

For years, as the cost of living's increased, the quality of life has gone downhill, and high-tech companies have consequently found it harder to do business in the Valley, there has been much hand-wringing and little action. Hayes leads this ambitious coalition of city governments, Chambers of Commerce, and industry in an effort to turn around these negative trends and work together to create a healthy economy and living environment, thereby keeping Silicon Valley productive and competitive in the decades to come.

Mark Hoffman

Chairman, President, and CEO

Sybase

Hoffman and his colleagues started Sybase in the belief that client/server based computing was the wave of the future, and the company's success (a fast-gaining second to Oracle in the relational database market, earning a top-20 position in Fortune's list of fastest-growing companies for the last two years) shows the accuracy of that vision. Pursuing a strategy of alliances with other vendors rather than attempting to provide closed solutions has also been a key element, giving Sybase the ability to link together diverse and often-conflicting hardware and software into smooth-running enterprise-wide systems.



Arthur Hsiao

President

Southern California Chinese Computer Association

Entrepreneur and systems integrator Hsiao has been a driving force behind the creation and acceptance of SCCCA. While small PC-compatible companies faced formidable challenges in 1992, with price-cutting driving many out of business, the SCCCA has allowed its members to work together and pool their resources to achieve better solutions for their customers and success for themselves.

Dave Hughes

Operating Officer

Old Colorado City Communications

Global telecomm's most notable frontiersman made a few more road trips and opened up some new territories in 1992, from online politics to international bridge-building. In his ongoing quest to create truly global online software technology that permits cost-effective graphics display for pictures and script, he's joined forces with some Moscow-based programmers to build a NAPLPS-based program. We await the next year's developments with interest.

Steven P. Jobs

President and CEO

NeXT

While still fighting an uphill battle to gain market share for his technologically sophisticated workstation, Jobs announced a startling and strategically significant move to gain acceptance in the mar-

ketplace—the porting of the NeXTstep operating system to Intel architecture. Ultimately positioned against Windows NT and Sun's Solaris, the OS offers some clear advantages over both, and its availability for 486 machines and the upcoming Pentium architecture is expected to make NeXT an attractive option in corporate environments.

Reese Jones

Chairman

Farallon

Farallon's founder has brought the company from its origins as the purveyor of BMUG's low-cost alternative to AppleTalk to the preeminent supplier of Macintosh networking products—its PhoneNet technology accounts for two-thirds of the installed base of Mac nets. But as multiplatform connectivity has become a key component of the network marketplace, Farallon has also moved into the Windows market, allowing Mac and Windows users to share files and peripherals on the same network. And in view of the number of SPARC machines in Farallon's booth at InterOp, it seems like a safe bet that Farallon will also be a key player as Mac and Windows machines connect to the UNIX world...



Philippe Kahn

Chairman, President, and CEO

Borland International

1992, Kahn told Dick Shaffer with characteristic forthrightness at the recent PC Outlook conference, "has been the worst year of my life."



Borland spent most of the year working on incorporating Ashton-Tate into the company and revamping all its applications to take advantage of its new object-oriented environment; the result, of course, was inevitable product delays, coupled with predictions of doom from the peanut gallery. Not to mention Microsoft's acquisition of Fox and subsequent entry into the database business.

But, as Kahn is fond of remarking, when he started the company in 1983, people said he had no chance.

One bright spot in 1992 was the long-delayed shipment of Quattro Pro for Windows in September; within three months, it was second only to Excel in the Windows market. And, with Windows Paradox due in early '93 and Windows dBASE shortly thereafter, Kahn will probably confound his competitors once again.

Jerry Kaplan

Chairman

Bill Campbell

President and CEO

Robert Carr

Vice President of Software

GO

1992 saw the arrival of the first products utilizing GO's PenPoint operating system, and it's off to a promising start. A significant player in the mobile computing market, GO offers a powerful challenge to Microsoft in setting the open-architecture standard.

Object-oriented technology aside, GO's OS offers the advantage of running on different processors—it's been ported to AT&T's Hobbit chip, for instance, and will run on EO's Personal Communicator line, due in early 1993. It is also a key component in the future products of hardware vendors overseas, particularly in Japan.

Mitch Kapor

President

Electronic Frontier Foundation

Reader Sam Chen writes that Kapor "has contributed greatly to protecting the end-user's civil rights and electronic freedom when the FBI is trying to do the opposite." But while there is no shortage, in the field of electronic civil liberties, of law-enforcement bashers among the hacker community, hacker-bashers in the law enforcement community, a high Fear Uncertainty and Doubt factor in business, and a general tendency to substitute demonizing your adversaries for trying to understand their viewpoint, Kapor stands out as a notable exception. He's been able to work with various constituencies to build rather than burn bridges, and has been instrumental in averting potentially harmful legislation such as the FBI's Digital Telephony proposal.



Arjan Khalsa

President

Intellitools

While it doesn't necessarily get a lot of fanfare, one of the greatest benefits of computer technology is its ability to provide tools for children, the disabled, and applications somewhat outside the mainstream. Khalsa and his company have worked for years to create useful, innovative products for these markets.

In 1992, the company began to ship Khalsa's invention, the IntelliKeys keyboard, which, with accompanying software and overlays, allows users of Apple II, Macintosh, and PC compatible computers to configure their keyboards to a variety of special purposes, from child-oriented interfaces to point-of-sale systems.

Ed LaHood

President

VREAM, Inc.

The VR Institute's Michael Conduris suggested we include LaHood on this year's list to honor his work in bringing virtual-reality capability to the PC environment. Says Conduris, "He single-handedly developed the first and most advanced non-programmer's version of a virtual reality development software package for the IBM PC. It's the most advanced on the market because it not only allows you to import textures and DXF files but also allows a user to program sophisticated dynamic links within virtual worlds—for example, when a person grabs a virtual book off a virtual bookshelf, a secret door will appear. No other so-called 'VR package' even comes close to the sophistication of this program [the VREAM Virtual Reality Development System.]"

We have a feeling this system will play a key role in the development of future entertainment packages, and probably find a host of "serious" applications as well.

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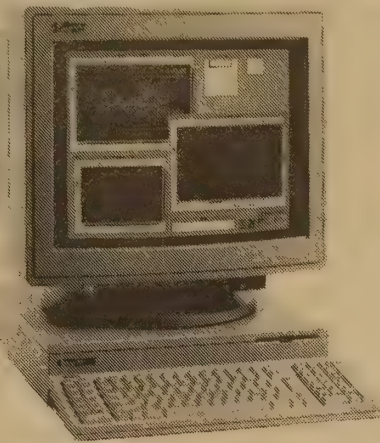
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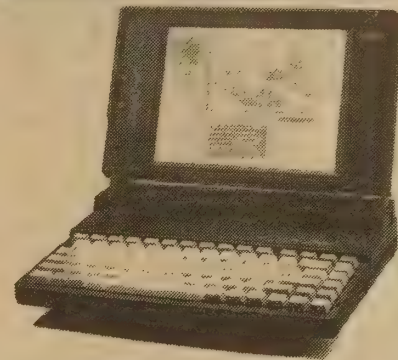
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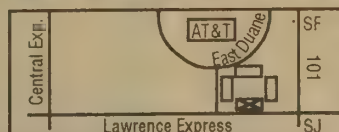
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Gilman Louie

Chairman

Spectrum Holobyte

This time last year, the future of Spectrum Holobyte was looking uncertain. True, the Falcon flight simulators were selling well, and likewise the whole Tetris family, but alas, the company was owned by the Maxwell empire, which was in a state of financial collapse.

However, the company managed to keep developing and shipping games on schedule and launched a highly successful foray into the 16-bit Super Nintendo/Sega Genesis market, and things are looking good for Spectrum Holobyte.

Louie managed to put together an impressive group of investors—ranging from leading venture capitalists Kleiner Perkins Caufield and Byers to Silicon Graphics chairman Jim Clark, not to mention AT&T—to buy the company back from the Maxwells and fund an ambitious sales, marketing, and product development effort in the area of interactive entertainment. And, at year's end, he had hired Barry James Folsom as the company's new CEO.

Among the company's new market directions is a national chain of Star Trek: The Next Generation virtual reality centers—which will use Silicon Graphics workstations to run state-of-the-art VR software.

Jim Manzi

Chairman, President, and CEO

Lotus Development Corporation

For several years now there have been plenty of allegations that Lotus is a single-product company doomed to extinction as competitors erode the market share of 1-2-3. Without conceding the spreadsheet market to anybody—the long-deferred 1-2-3 for Windows has shipped and further enhancements are in the works—Manzi has worked to broaden the company's base and keep it competitive in emerging markets. Among the indications that this strategy is succeeding is the rapid growth of the market for Lotus Notes and cc:Mail, targeting the workgroup/collaborative computing area.

Michael Marvin

Chairman

MapInfo

Another technology market moving from the niche to the mainstream is Geographical Information Systems, and Marvin, who's been with MapInfo since its foundation in 1986, has led it to a position of #23 on the *Inc.* Magazine list of fastest-growing private companies and a preeminent position in its market.

MapInfo desktop mapping software works with popular spreadsheet and database programs on Windows, Mac, DOS, Sun, Hewlett-Packard, and other systems to allow businesses to view their information in a geographical context. This approach allows for analysis of trends, patterns, and relationships that aren't necessarily evident

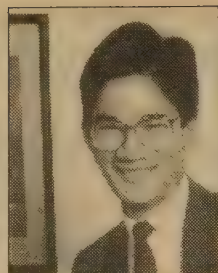
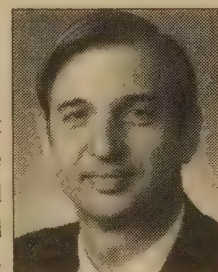


PHOTO: ALAIN McLAUGHLIN



PHOTO: BILL GALLERY



on text-based database and spreadsheet reports, and makes computers into far more versatile tools.

Scott McNealy

Chairman, President and CEO

Sun Microsystems

It was another great year for Sun, with new SPARC hardware and the long-awaited Solaris operating system software shipping and reinforcing the company's preeminence in the workstation marketplace. The company continued to gain market share in the commercial environment—commercial client/server systems now account for a third of its business, with the rest in its historically strong technical market.

In the battle for the networked power-user's desktop, McNealy appears to be pursuing a successful dual strategy with regard to Intel and Microsoft—conceding no turf to Microsoft and the NT platform in the Intel world, he's made sure Sun's operating system runs on Intel platforms. Nonetheless, he's also consistently maintained the superiority of Sun's RISC-based SPARC architecture, which has itself become a significant standard in the workstation world. Whichever way the market goes, Sun's ready to take advantage of it.

Nathan Morton

President and CEO

CompUSA

Probably no organization represents the dramatic shift in the computer sales channel as well as this successful national chain of superstores, led by longtime retail veteran Morton. Despite oft-expressed skepticism that Morton could maintain the company's initial success and continue its meteoric growth, his leadership and ability to convince the analysts have silenced most of the skeptics. In 1992 the company not only went public but completed a second stock offering in October, and expanded its operations into new areas, notably the New York market.

Therese Myers

President and CEO

Quarterdeck

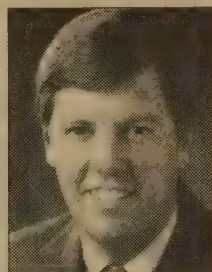
From Quarterdeck's startup days, Myers has maintained a fierce commitment to helping budget-minded users get better performance out of their hardware. The company entered a new era in 1992 with the shipment of DESQview/X, software which allows PCs to emulate UNIX-based X Windows terminals and run X applications that reside on network servers. As computing environments become more heterogeneous and DOS users start contemplating the UNIX environment, DESQview/X provides an easy transition and painless upgrade path.

Ray Noorda

Chairman, CEO, and President

Novell

Noorda's shrewd instincts for strategic alliances, good customer relations, and support for a full range of hardware and software have kept Novell the



undisputed leader in the network world. Last year's acquisition of Digital Research, whose DR DOS is regarded by many as a superior operating system to the Microsoft version, has provided Novell with a powerful strategic weapon for its impending clash with Microsoft's coming Windows for Workgroups.

As networks become an integral part of computer-based work, Novell is clearly planning to take on the giant Microsoft, and appears very well positioned to be one of the dominant players in the next generation of computing.

John Norstad

Author

Disinfectant

Viruses are an ongoing problem in the computer-using community, and many commercial organizations have arisen to deal with them. Norstad, however, continues to keep his product Disinfectant up-to-date (it usually has a fix for new infestations long before the commercial products do) and give it away, earning the undying gratitude of Mac users everywhere.

David Packard

Chairman

John Young

CEO (retired October 1992)

Lewis Platt

CEO Hewlett-Packard

One of our readers writes that Hewlett-Packard is "a very well-run company that has been around 50 years and will be around another 50!" On the whole, this seems like a conservative estimate. Two years ago Packard and Young, who served as CEO from 1978 until his retirement in October, became concerned with the company's straying from its roots in the famed H-P Way and losing its ability to innovate and adapt to changing markets. Unlike some other venerable giants facing this problem, they achieved a rapid turnaround, which Young attributed in large measure to Platt's work, particularly his aggressive introduction of new workstation technology to keep the company a formidable competitor with Sun.

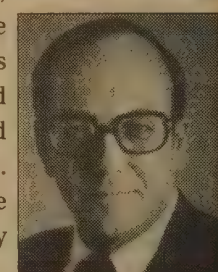
After taking over as CEO upon Young's retirement, Platt announced his intention to keep Hewlett-Packard a dynamic player in emerging technologies, with particular emphasis on communications technology and hand-held computers. Expect to see the growing popularity of the HP95LX palmtop parlayed into a wide range of devices positioned to take advantage of the emerging "personal digital assistant" market.

Gayle Pergamit

Cofounder, Director of Marketplace Development

American Information Exchange (AMIX)

Pergamit (whose other accomplishments include coauthorship with Eric Drexler and



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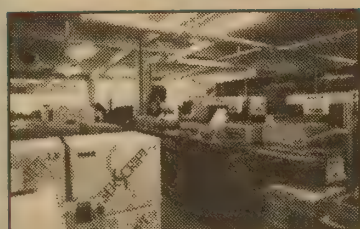
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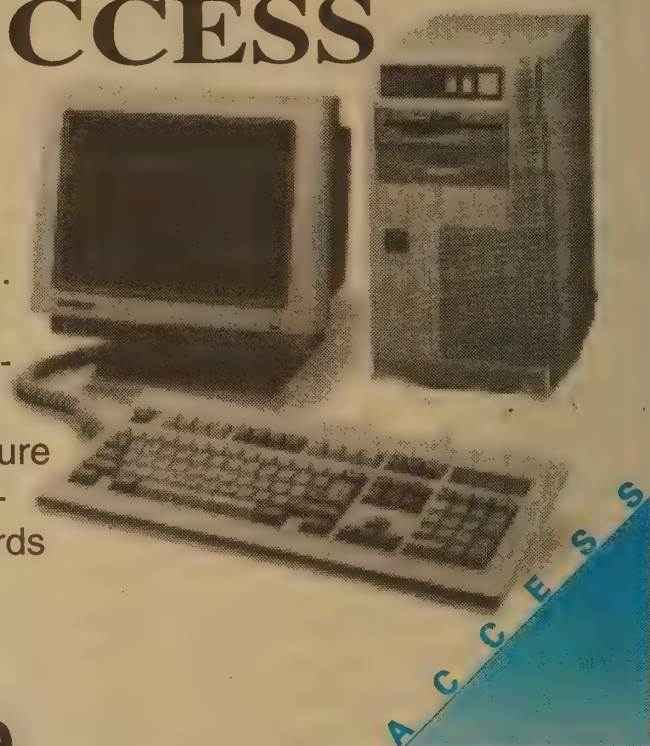
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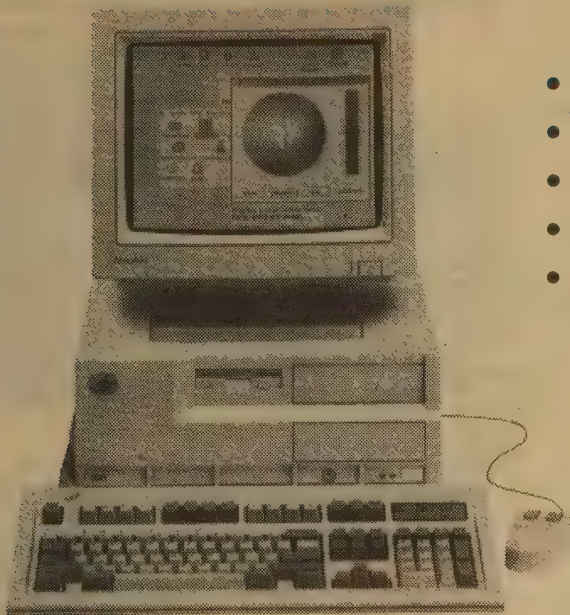
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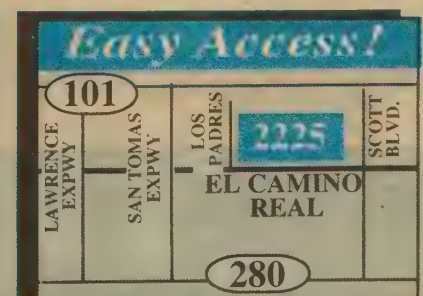
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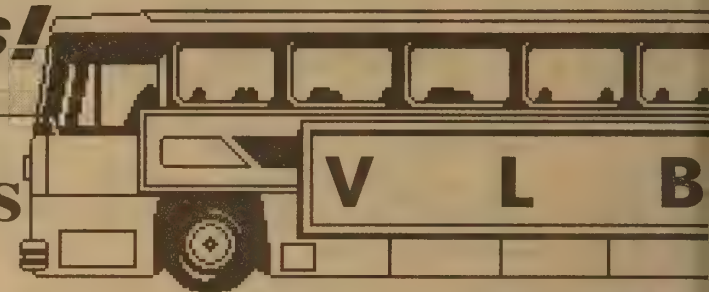
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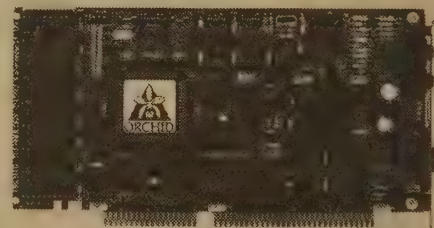
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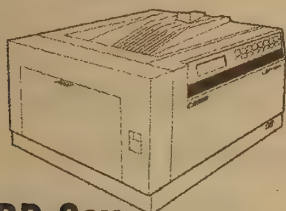
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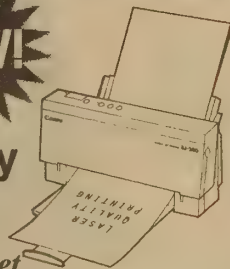
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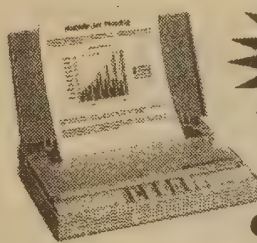
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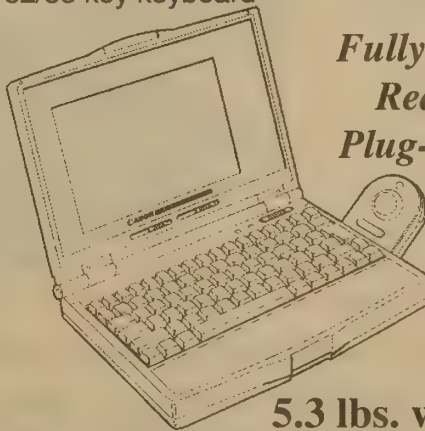
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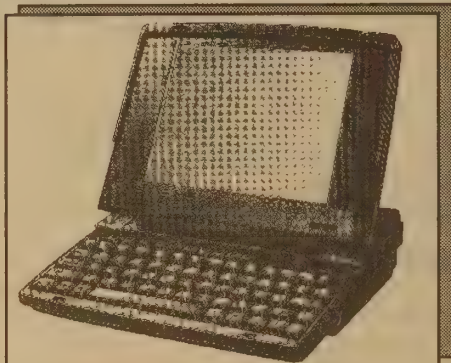
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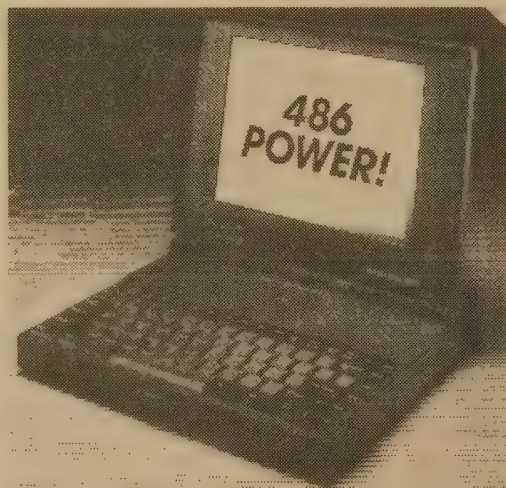
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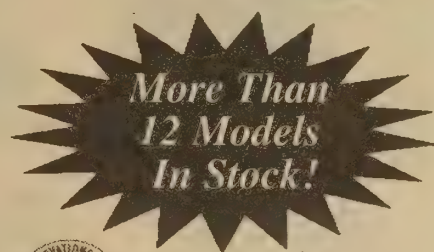
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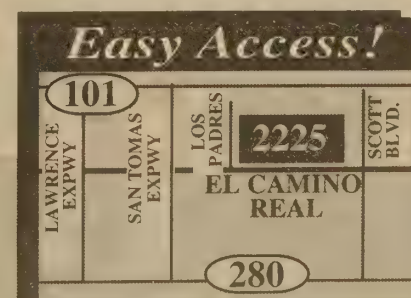
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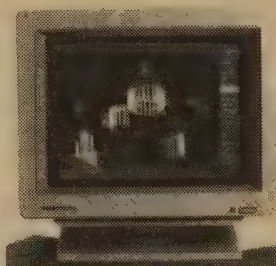
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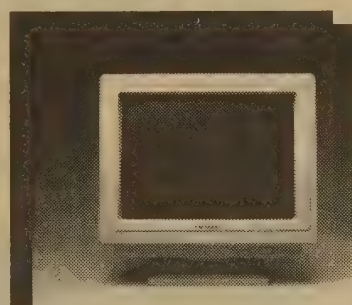
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- 20" CRT (19" viewable) with black matrix, dark glass and a glossy face
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1280 x 1024

2082DC

- 20" (19V) Trinitron CRT
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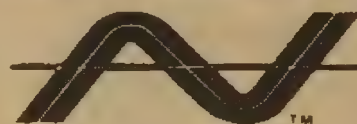
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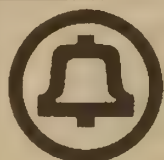
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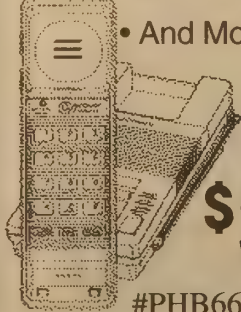
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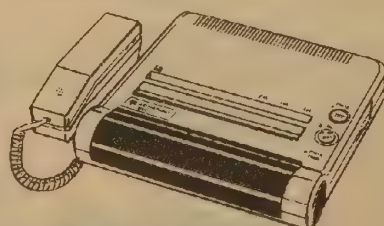


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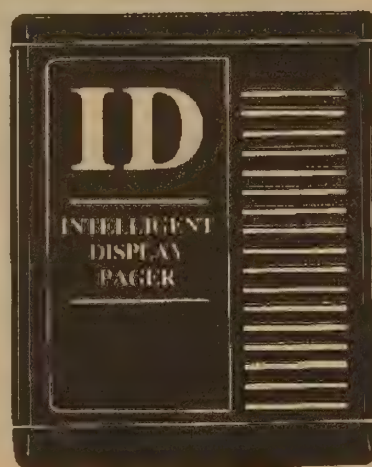
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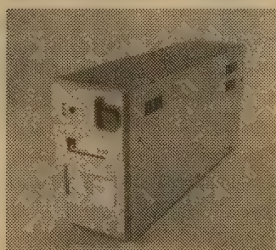
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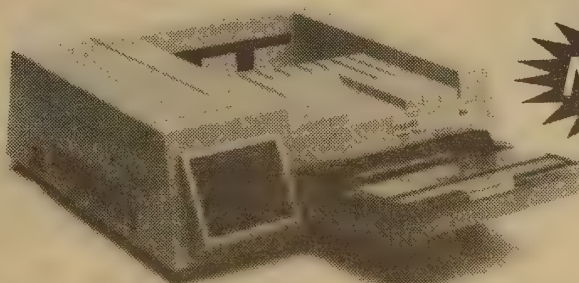


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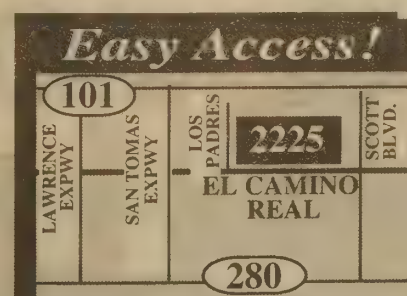
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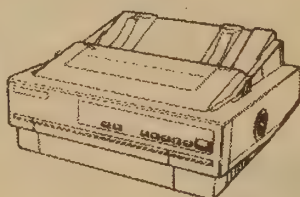
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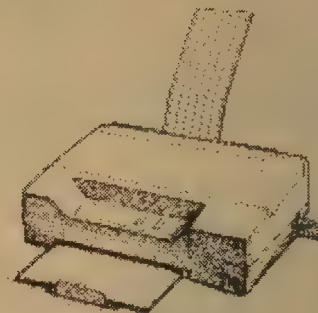
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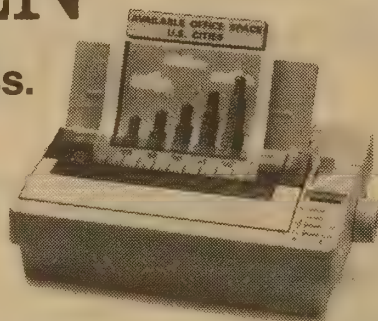
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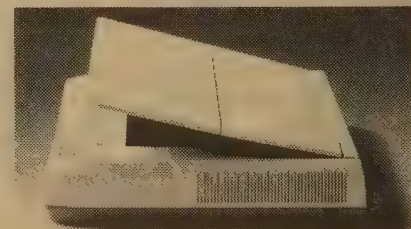
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- Up to 300cps, 99cps LQ
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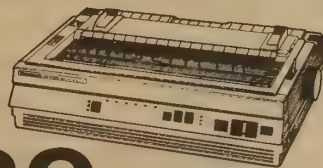
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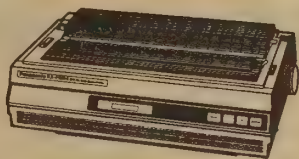
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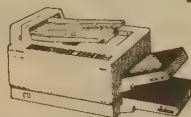
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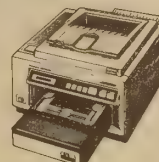
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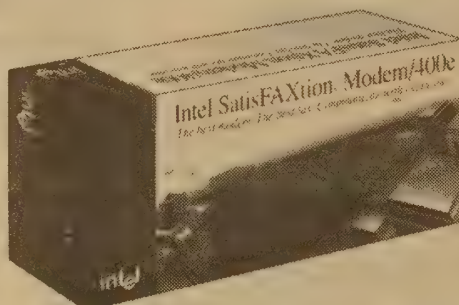
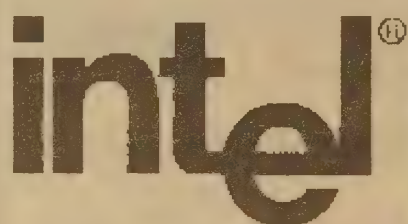
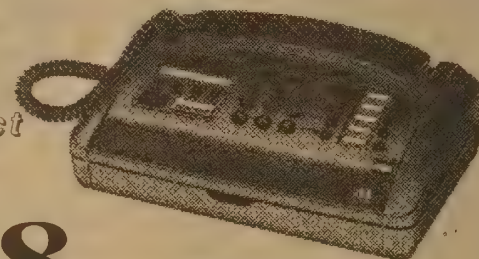
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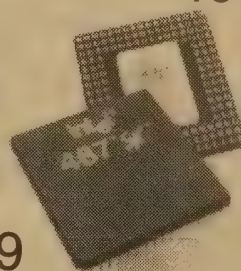
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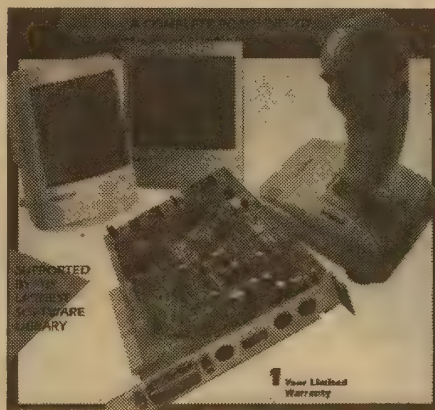
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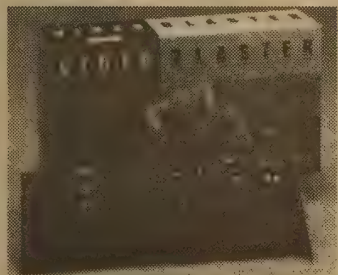
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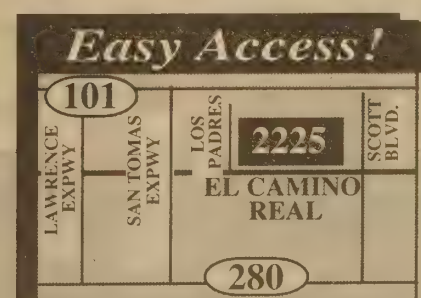
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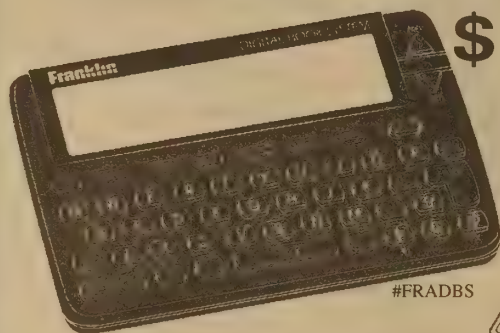


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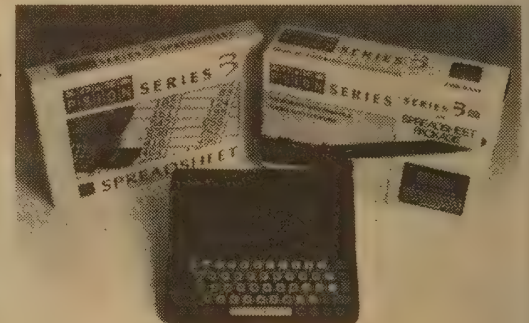
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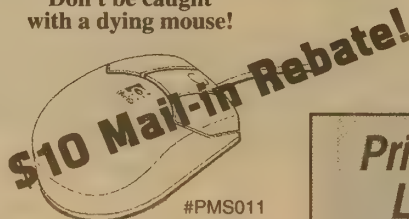
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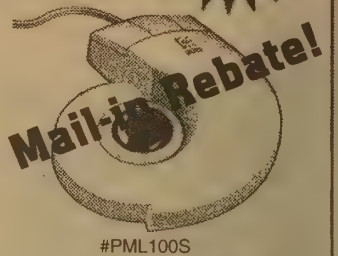
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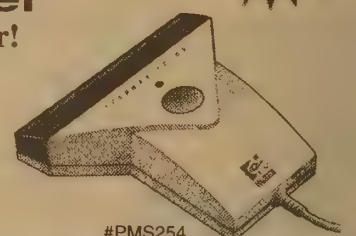


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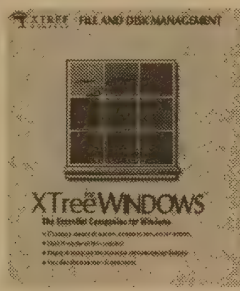
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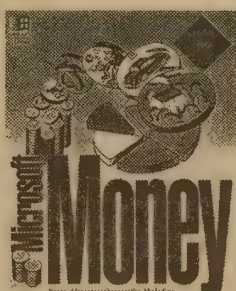


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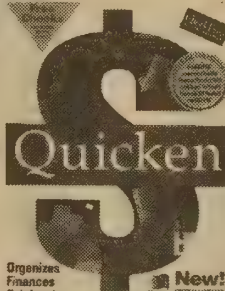
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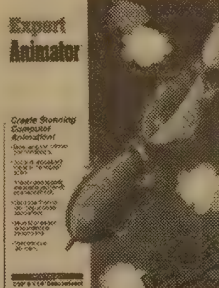
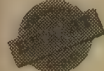
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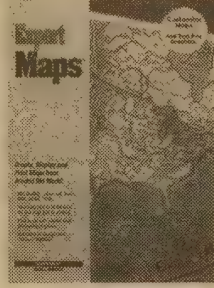
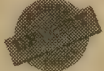


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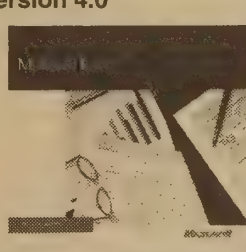
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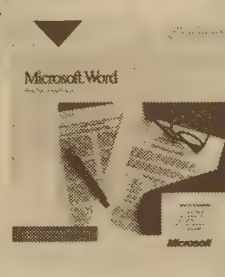


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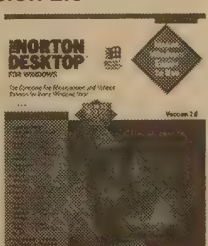
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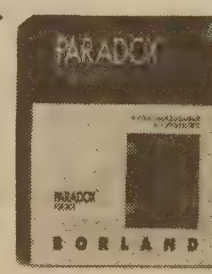
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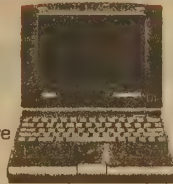
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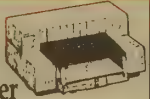
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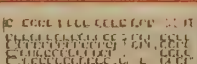
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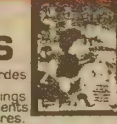
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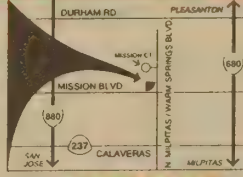
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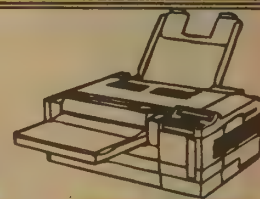
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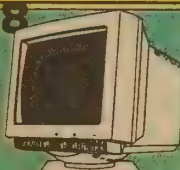
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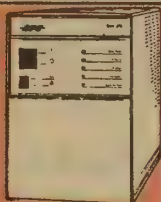
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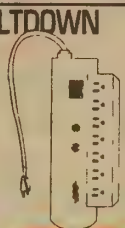
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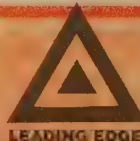
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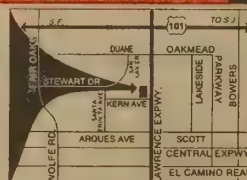
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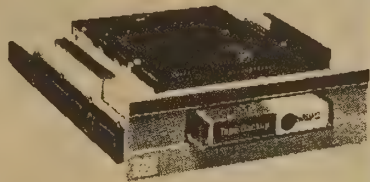


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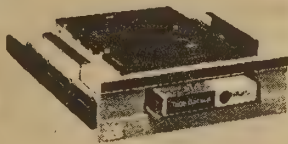


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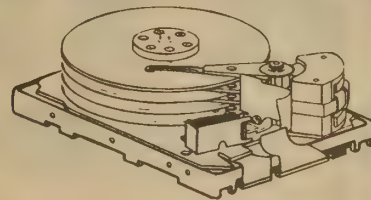
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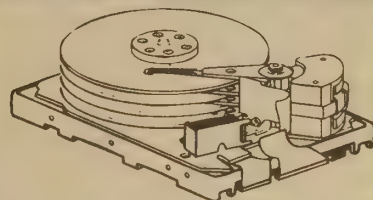
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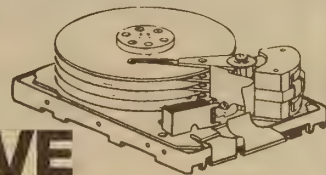
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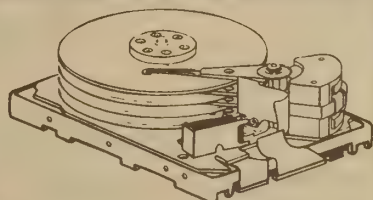
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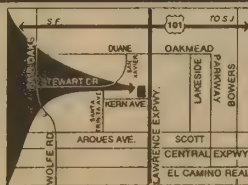
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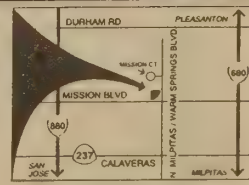
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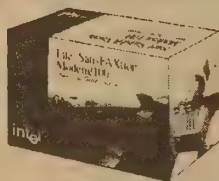


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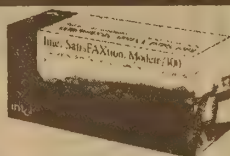


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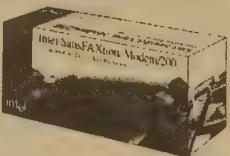


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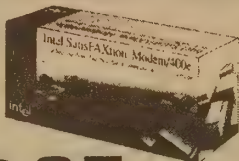


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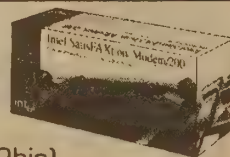
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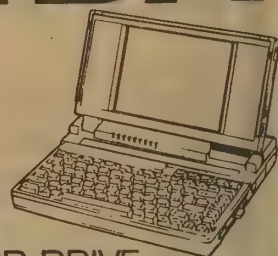
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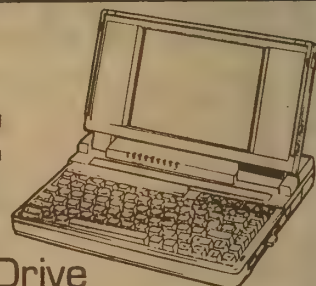
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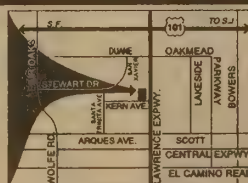
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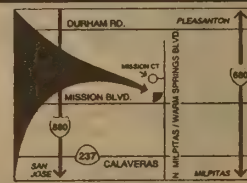
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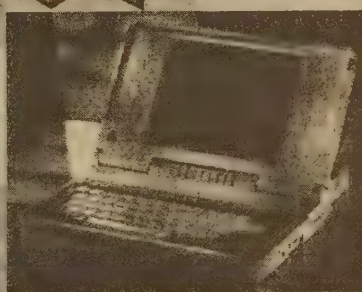


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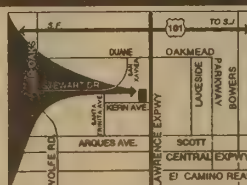
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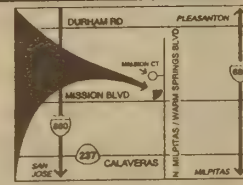
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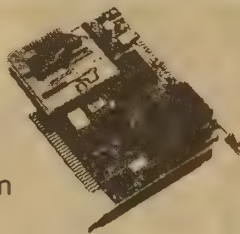
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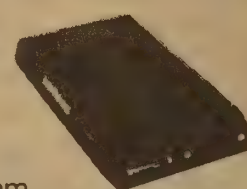


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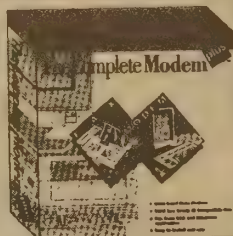


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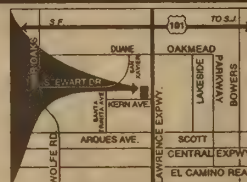
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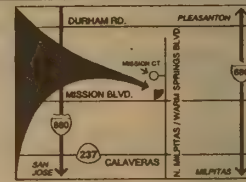
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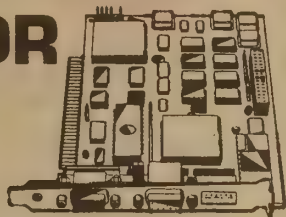
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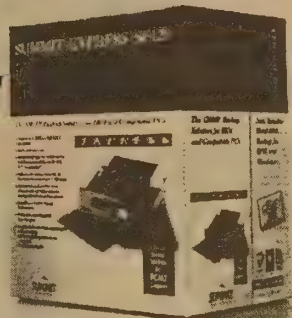
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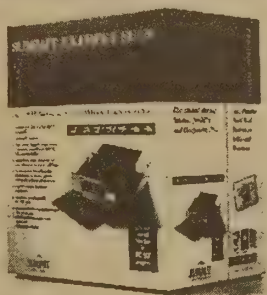
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Package includes: 14.4/Fax Modem, user's manual, phone cord; lifetime warranty, technical support, FREE fax and modem software, and FREE CompuServe® bonus.

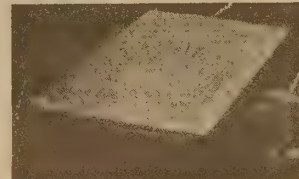
CCITT V.32bis, V.32, V.23, V.22bis, V.22, V.21; Bell 212A, Bell 103J
FAX V.29, V.27ter (Group 3); PC FAX
EIA/TIA-578 (Class 1) compatible
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Error Correction: CCITT V.42 or MNP 4-2
Command Set: HAYES AT
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8.75 in (22.0) D
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68, AWWUSA-73706-FA-E; Listed UL 1950;
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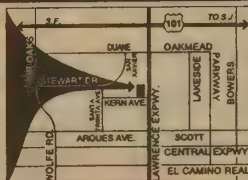
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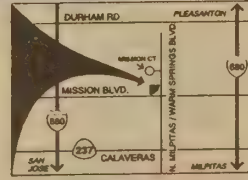
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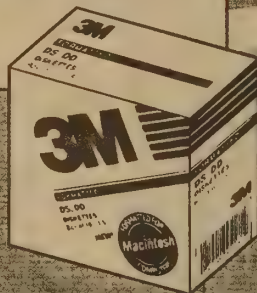
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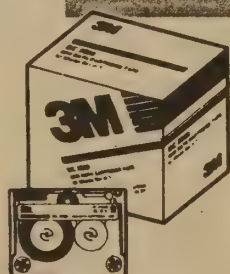
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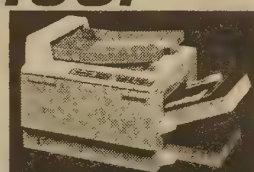


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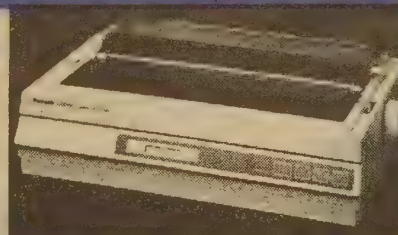
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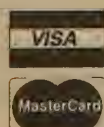
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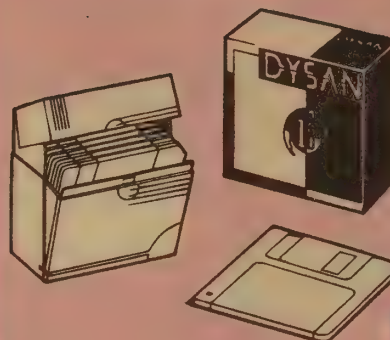
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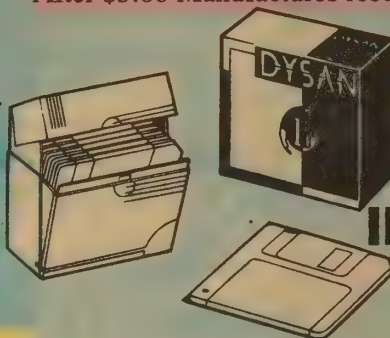


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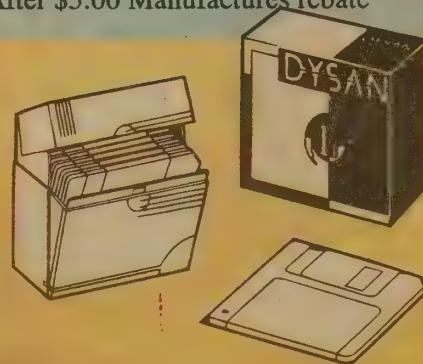
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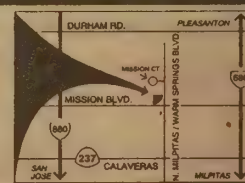
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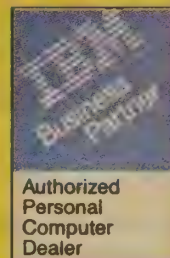


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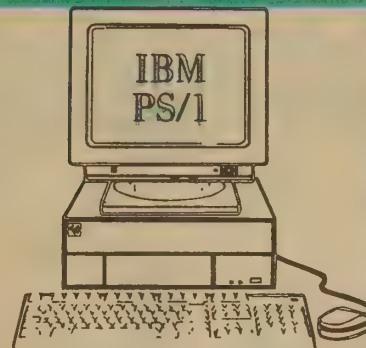
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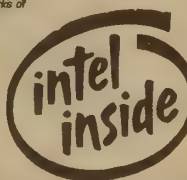
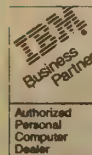
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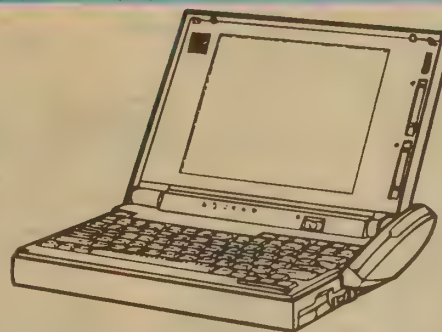
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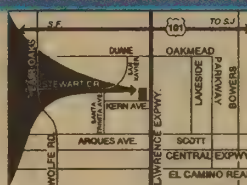
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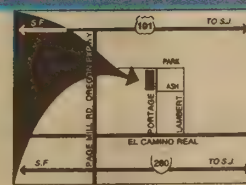
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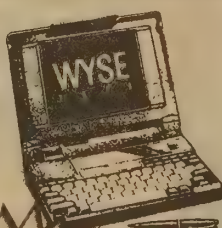
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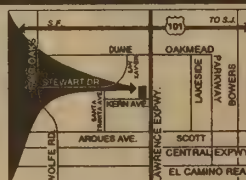
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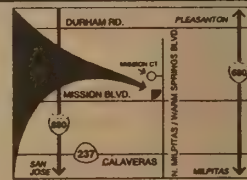
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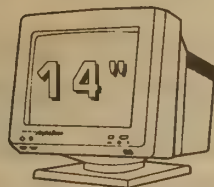


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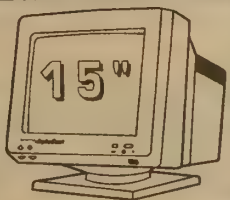
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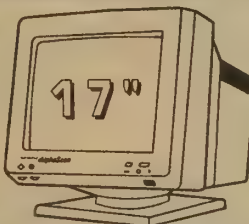
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MONITOR**



1024 X 768 Non-Interlaced • Flat Screen
INVAR Shadow Mask 70HZ Refresh VESA
15" Large Screen
SAMPO KDM-1566
#1691742

\$529⁹⁵

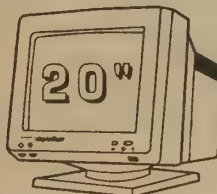
**1280 X 1024
NON-INTERLACED
17" SUPER
VGA MONITOR**



1024 X 768 Non-Interlaced Flat Screen
Up to 1280 x 1024 Resolution
INVAR Shadow Mask
70HZ Refresh VESA
17" Large Screen
SAMPO KDM-1766 #1691753

\$849⁹⁵

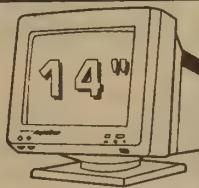
**1024 X 768
NON-INTERLACED
20" SUPER
VGA MONITOR**



1024 X 768
Non-Interlaced .31 Dot Pitch
Flat Screen
INVAR Shadow Mask
70HZ Refresh VESA
20" Large Screen
SAMPO KDM-2055 #1691764

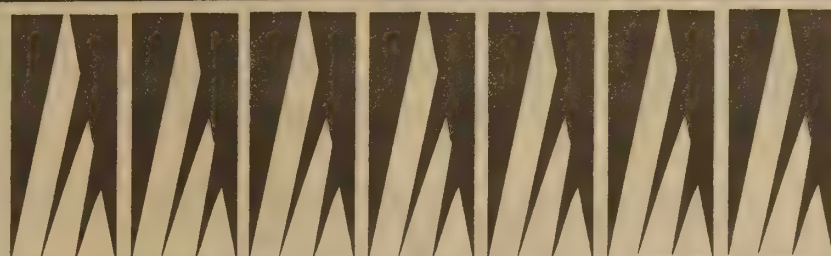
\$1299

**14" MAC
VGA MONITOR**



30 TO 40 KHZ WORKS WITH ALL MAC
EXCEPT QUADRA
28 DOT
14" LARGE SCREEN
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#1735381

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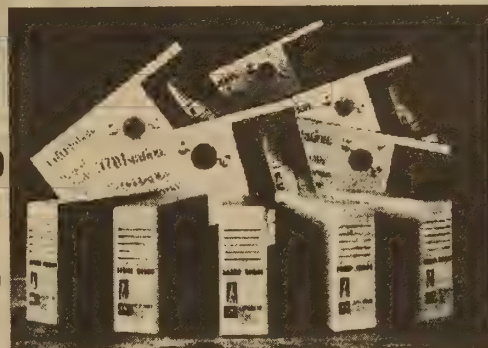


PSI PSI PSI PSI PSI PSI PSI

PSI COMstation ONE

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DATA MODEM
9600 BAUD
SEND 4800 BAUD
RECEIVE FAX**

COMstations are as convenient to use as they are powerful. Their small, ergonomic design features a Macintosh-like exterior with the ON/OFF switch right on the front, within easy reach.
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PSI COMstation FOUR

**9600 BAUD MODEM
9600 BAUD SEND/RECEIVE FAX**

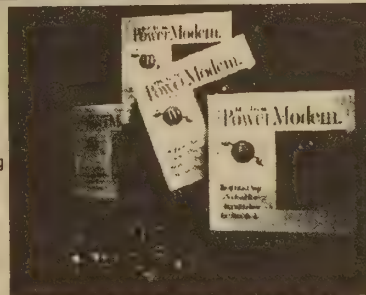
COMstations are as convenient to use as they are powerful. Their small, ergonomic design features a Macintosh-like exterior with the ON/OFF switch right on the front, within easy reach.
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145, 160, 170, 180**

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#1734689



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V.42BIS MNP5 OCR**
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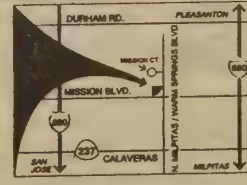
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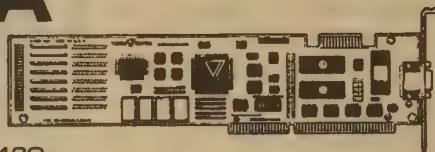


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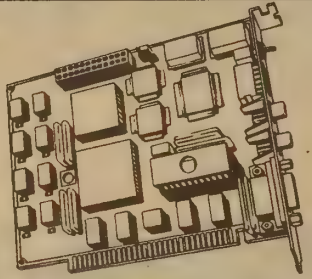
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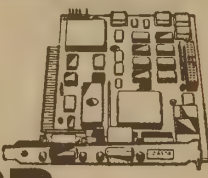
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512K up to 1MB
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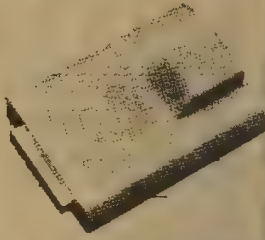
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For PC/XT/AT, PS/2 Model 30
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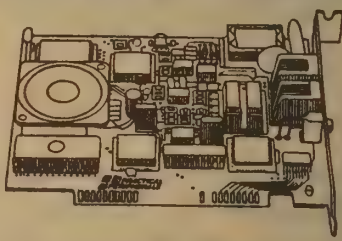
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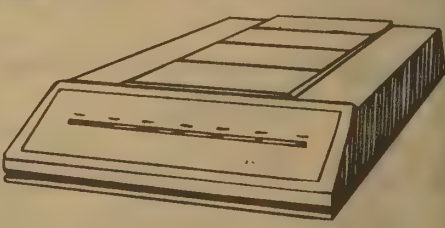
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AVOID SYSTEM MELTDOWN



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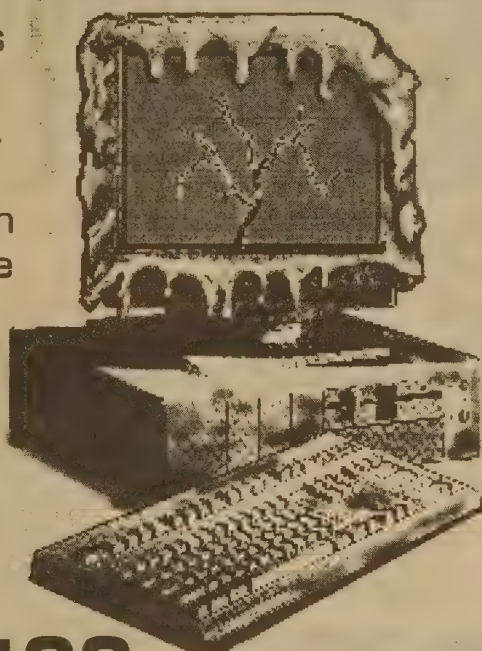
A Subsidiary of SL Industries, Inc.

TVS

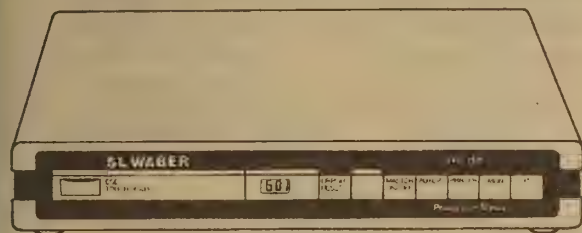
Transient Voltage Surge

They can destroy your machine or cause intermittent errors

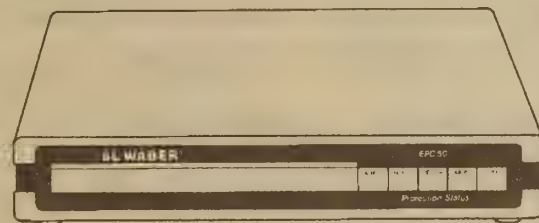
**PROTECT YOURSELF
YOUR INVESTMENT AND
YOUR PRECIOUS TIME!**



The **EPC 150** offers "anti-crash" feature for hard disks and an electrostatic discharge pad for eliminating potentially damaging static electricity. It adds two RJ-11 phone jacks for phone line protection, and a digital clock. It has 4 outlets and with a maximum surge energy dissipation of 401 Joules. Clamping response time is <1 picosecond.



The **EPC 50** features a push-button front panel for individual peripheral control and indicator lights for power and surge suppression status. It is CSA approved, meets the UL 1449 standard, and exceeds the IEEE 587 standard. The **EPC 50** combines surge and line suppression and manual power-up for up to five devices. It has 5 outlets and with a maximum energy dissipation of 401 Joules. Clamping response is <1 picosecond.



MODEL EPC 150 # 1754696 **\$124⁹⁹**

MODEL EPC 50 # 1754674 **\$84⁹⁹**

DG204 SURGE

4-OUTLET STRIP DATAGUARD SURGE PROTECTOR, 210 JOULES MAX. SURGE ENERGY, <1 NANOSECOND CLAMPING RESPONSE TIME

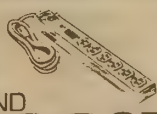
135440 **\$13⁹⁵**



DG415S SURGE

6-OUTLET STRIP WITH 2RJ-11 JACKS FOR FAX & MODEM PROTECTION, 210 JOULES MAX SURGE ENERGY, <1 NANOSECOND CLAMPING RESPONSE TIME

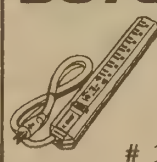
#1417948 **\$36⁹⁵**



DG7SAM 7-OUTLET

330V SURGE PROTECTOR INCLUDES MODEM PROTECTION AND SITE FAULT WIRING INDICATOR

1754663 **\$29⁹⁹**



DS6 6-OUTLET

3 PHASE SURGE PROTECTION & NOISE FILTRATION, 346 JOULES MAXIMUM SURGE ENERGY, <1 PICOSECOND CLAMPING RESPONSE TIME

#1754652 **\$59⁹⁹**



DSD SURGE 4-OUTLET

4-OUTLET DROPOUT BLACKOUT AND BROWNOUT SENSORS, 346 JOULES MAX. SURGE ENERGY, <1 PICOSECOND CLAMPING RESPONSE TIME

1473366 **\$74⁹⁵**



6-PLUG POWER STRIP

Protects Surges Up To 90 Joules 15 amp Breaker Fuse

#97696 **\$13⁹⁹**

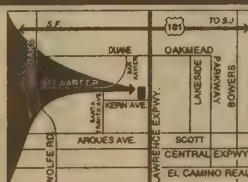


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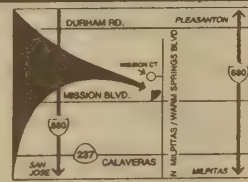
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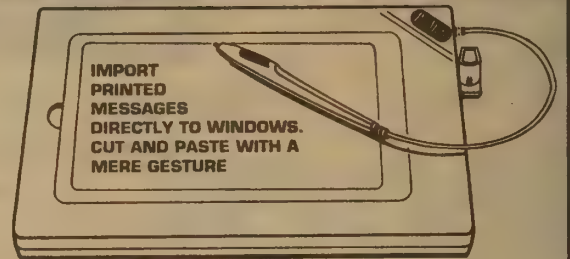
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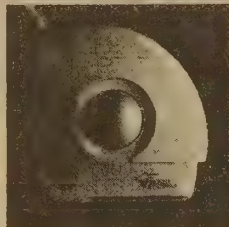
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- Includes free carrying case and a 3-foot extension cable
- Includes the Mouse Systems Lifetime Customer Support Guarantee
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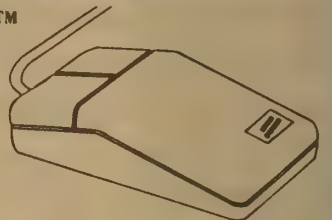
#1723641



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OmniMouse™

200 DPI Resolution Adjustable
from 20-6400 DPI
2 Button Serial
Fully Microsoft Mouse Compatible
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3-Button Mouse
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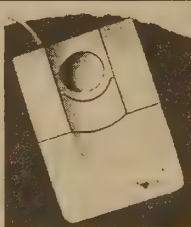
SOFTWARE FEATURES:
20 CPI Resolution, variable mid-range resolution and fast, high performance 6,400 CPI to save time and minimize workspace.
Selectable MS or Mouse Systems Ultra Res™ ballistic acceleration
Buttons reassignable for right or left-handed use
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PC Trackball II

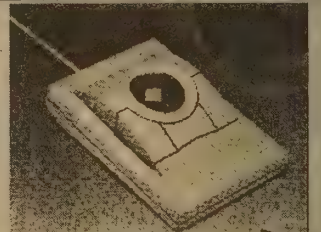
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For Mac II Series, Mac SE and Apple IIGS
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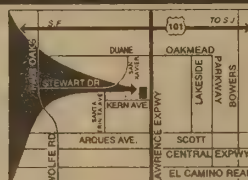
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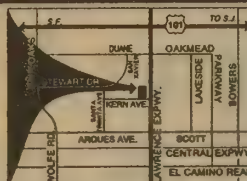
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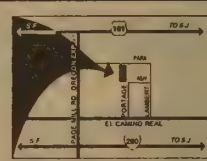
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Discover the New EasyStep™ System.

Introducing EasyStep... a revolutionary new tax preparation system that leads you through your tax return from start to finish... guides you every step of the way... and completes the return for you automatically. More than just an interview or tutorial, EasyStep is a whole new way to do your taxes. And only TurboTax has it.

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Every independent test proves Memory Commander delivers the most available DOS memory of any memory manager!

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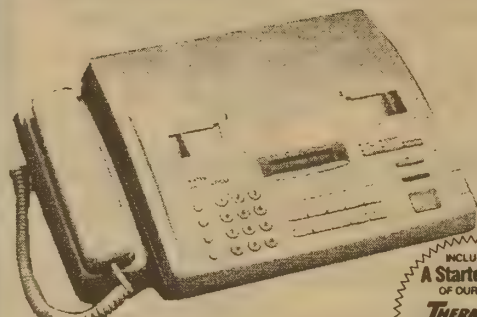


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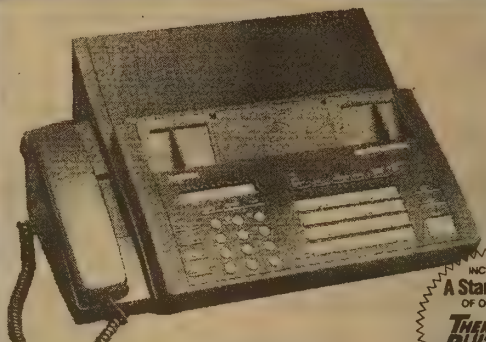
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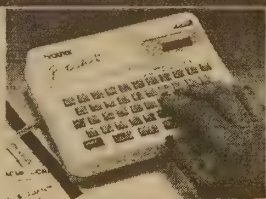
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w/CUSTOM
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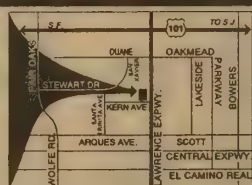
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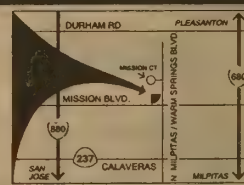
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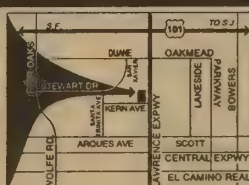
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20MHZ DUAL-TRACE OSCILLOSCOPE

Dual or Single Trace Operation • +1mV/DIV Sensitivity
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Overload Protection, Audible Alarm & Flashing
LED with overload. Ripple: 300uv RMS,
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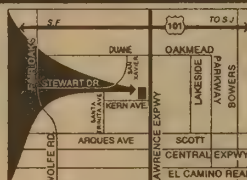
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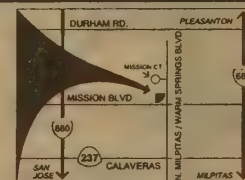
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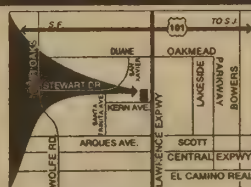
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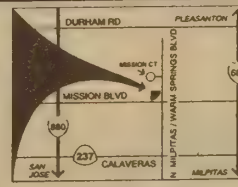
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Early Days At Autodesk

An Interview With Carol Bartz

BY KATE
BUTTON



Hey!" exclaims one of our online buddies as we're going to press. "Carol Bartz is on CNN talking to Clinton and Gore!"

Since April, when she arrived at Autodesk from the number-two spot at Sun to assume the position of president, CEO, and chairman, Carol Bartz has been in a pretty relentless media spotlight. Hardly a single commentator had failed to analyze the company's fortunes and prospects in the wake of founder John Walker's "Autodesk: The Final Days"; hardly a publication failed to reassess all this when Bartz was appointed. In some quarters, the novelty value of a female CEO for one of the world's largest software companies seemed to outweigh interest in her qualifications for the job.

Then, while dealing with formidable transitional challenges like reevaluating the company's product strategy (resulting in its eventual decision to divest its holdings in Xanadu and AMIX, and to make some investments in other areas) and bringing in new management, Bartz was suddenly faced with a new problem: a diagnosis of breast cancer. After a month of medical leave for surgery and convalescence, she was back at the office and back at the helm, and has spent the subsequent months giving clear evidence of strong, capable leadership.

All of which has been much chronicled, so when British journalist Kate Button called to say she was going to be interviewing Bartz for some European publications, and to inquire whether we'd be interested in an article, we didn't think so. What new insights could possibly be forthcoming? And

besides, we had so many Autodesk-related articles in the works that people were going to think we were the Autodesk fanzine or something...

Fortunately, Kate sent us the transcript, and we decided there were worse fates than being erroneously perceived as an Autodesk fanzine. We figure if an interview this good comes along and we do not present it to our readers, we're fundamentally not doing our job.

So, with thanks to Ms. Bartz and Ms. Button, we hope you find this as enlightening and thought-provoking as we did.

—Mary Eisenhart

WHAT WAS THE MAJOR INCENTIVE FOR YOU TO MOVE OVER FROM SUN TO AUTODESK?

I like to think that I came to Autodesk and did not leave Sun. There's an important differentiation. I could have stayed at Sun forever; it's a wonderful company and I had been there nine years, was very happy, and had an important position.

However, Autodesk offered such a unique opportunity—its leadership in the CAD software industry, its industry position relative to its market share, the fact that it's dealer franchise based, and the fact that I think software is really where the action is.

WAS IT A HARD TRANSITION FROM HARDWARE TO SOFTWARE?

Frankly, no company except a components company is a hardware company. Two-thirds of our engineers at Sun were software engineers, and software was a big component of any sale. I feel I was truly in the assistance business before, as well as the hardware business. Now in a software company, we're still dealing with the platforms that it runs on, so the two fields are not as far apart as one might imagine.

In a software company the issues are different. You don't have the big manufacturing issues that you have when you're trying to get hardware out the door, so the management of the company is a bit different.

ARE THERE SIGNIFICANT DIFFERENCES BETWEEN WORKING FOR A \$285 MILLION COMPANY AND A \$3 BILLION COMPANY?

A company this size has all of the basic infrastructure needs that a large company has, only in smaller amounts. For instance, we might have a human resources department here of twenty people, and at Sun it was two hundred, but you still need the department. If you have a very small company there are certain things that you don't need, but Autodesk is very large for a software company—it's a bonsai version of a Sun.

WHAT ARE THE MAJOR CHANGES YOU INTEND TO MAKE HERE TO TURN THE COMPANY FROM A \$285 MILLION TO OVER A BILLION-DOLLAR COMPANY?

The company has a very good product in AutoCAD, which is the major revenue stream

of the company. To move the company forward we intend to diversify the company into the design automation space, into the manufacturing arena, into solids and surfaces—all those things that you need to get from "art to part," from the concept to the design; to actually having that part available, and, of course, to maintaining it. The idea is to take us from the good market we're in, design and drafting, and to extend it into the other markets within the CAD arena.

WHICH ARE THE MAIN MARKETS YOU'RE AIMING AT?

Mechanical engineering, and GIS or Geographical Information Systems. Both are important areas for our growth. We have a good relationship with a California company, ESRI [Environmental Systems Research Institute], that does mapping and GIS. Together we offer a joint product called ArcCAD.

Through our recent acquisition of MES [Micro Engineering Solutions], we are strengthening our offerings to the MCAD market.

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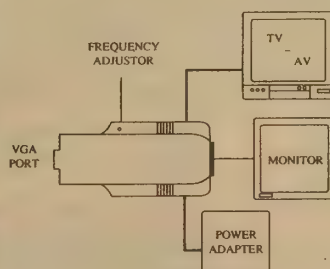
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Programmers at Autodesk have been described as a theocracy of hackers, and an unruly clique. Why is that?

A lot of it made good ink.

you do your math, that gets us to the billion-dollar level in five, six, seven years, give or take a year.

AUTODESK SUFFERED A DIP IN PROFITS BY 28% IN THE LAST QUARTER OF LAST YEAR AND ANOTHER DROP OF 41% IN THE FIRST QUARTER OF THIS YEAR. WHAT IS THE REASON?

That was all planned. The company had gone to the public and said it wanted to reinvest in itself—in its infrastructure, in sales and marketing, particularly in the Asia-Pacific region; in the AutoCAD Release 12 rollout; and in the other products we have planned. For example, we have twenty-five products coming out this fiscal year, and we believed we needed to invest in really good marketing programs to support our engineering development.

So that was all planned. While the year base is certainly down, relative to the commitment we've made on the fiscal year, we're on target or better.

AUTOCAD ACCOUNTS FOR 80% OF YOUR REVENUE, AND YOU'VE MENTIONED DIVERSIFICATION. IS THAT HAPPENING SINCE YOU ARRIVED, AT YOUR INSTIGATION?

Before I arrived, the company had several products it was marketing that made up the other 20% of the revenue. Since arriving, I have worked with the new team to put a strategic stake in the ground, and say that rather than focusing on random technical software, we really believe we are a CAD company first and foremost. We are concentrating our effort on becoming an even bigger CAD company.

Some of the other products we develop and market work with modeling and rendering products from our multimedia division. We use the same basic core technology—whether it's solids, rendering, geometry—that is used in our CAD technology.

In the future, it's clear that in a number of years, anyone that wants to build a house will be able to walk through it using virtual reality, and say "I like the size of the living room and kitchen," rather than see it on a flat plan,

which most of us can't relate to.

We are actually putting engineering dollars into this forward technology, selling products today that are not necessarily in the CAD market—for example, our animation and studio products that I mentioned. We are selling these products now and investing in a future CAD strategy. We believe the products and the technology will slide right into a basic CAD product.

DURING THE EVALUATION OF THE PRODUCTS, WHEN SOME WERE ELIMINATED, WAS THERE A PERIOD OF INSTABILITY, AND WERE YOU SEEN AS THE HATCHET WOMAN?

I don't think so. On some of these issues the employees themselves were questioning how the products fitted into the main strategy, so I believe that management's action to take a step to clean up the strategic vision of the company was actually welcomed by the employees. We did it in a very civilized manner; we are not dumping these people in the parking lot.

To be very clear, the people at AMIX and Xanadu were not Autodesk employees. We were 80% shareholders of those companies, so we funded them, but they were not our employees.

YOU ARRIVED AT AUTODESK AT A TIME OF INSTABILITY IN TERMS OF MANAGEMENT. WHAT ARE THE HARDEST PROBLEMS YOU FACE COMING INTO A SITUATION LIKE THAT?

Actually I think those circumstances mean opportunity. If you're walking in when everything is seemingly stable and everything is in place, I think you have to work harder to add value. Walking into a situation like this, it was an opportune time to bring in my team, hire a few people that I thought would bring the company up to a billion dollars, and provide a lot of fresh energy and fresh ideas. The instability attracted me.

The instability was also felt by the employees, and they viewed the new management team as a stabilizer for the company. It was positive on both sides.

SILICON VALLEY IS RENOWNED FOR PROMOTING A FREE AND EASY ATMOSPHERE AT WORK. TO WHAT EXTENT DO YOU CONDONE CREATIVE PEOPLE HAVING FREEDOM?

Many technical companies have their own style. I see nothing wrong in allowing people to dress as they wish. Autodesk has a very unique style—we allow animals in the office, and so be it. There is nothing wrong with that.

I think trying to contain people with those kinds of measures is archaic management thinking. Obviously there comes a point where someone is going to meet the public in a sales and marketing position, and they should dress accordingly. But the public knows technical people wear jeans and T-shirts, and so be it—it doesn't stop their minds from working. Maybe I've been in Silicon Valley too long, but it all seems pretty natural to me.

WAS THERE NO RESENTMENT ABOUT YOU BRINGING IN ALL THESE NEW PEOPLE?

I've been very careful about the senior executives I'm bringing in. I want them to also adopt the spirit here; I don't need any heavy hands. There's a lot of passion for the company, the customers and the products. The worst thing to do would be to squelch that, so you find that they fit very nicely into the organizational style. Again, the new executives offer support, and not a lot of rules and bureaucracy.

There have to be changes and order and structure when you have fourteen hundred people; otherwise you do have group gropes. You have to say, "This is how decisions are made," and who makes that decision, but you also allow for input.

AS PEOPLE DO NOT HAVE JOB DESCRIPTIONS, ARE THEY SUFFICIENTLY FOCUSED, AND DO THEY KNOW WHAT IS EXPECTED OF THEM?

People want job descriptions, because it allows you to know if you are doing well or badly in your job. I wake up every morning believing I know what my job is and measuring my performance by that, and I believe that the employees are looking for a bit more structure. Job descriptions can be very inhibiting, but you can't say they've gotten in the way of Autodesk. Look what the company has done in ten years without them.

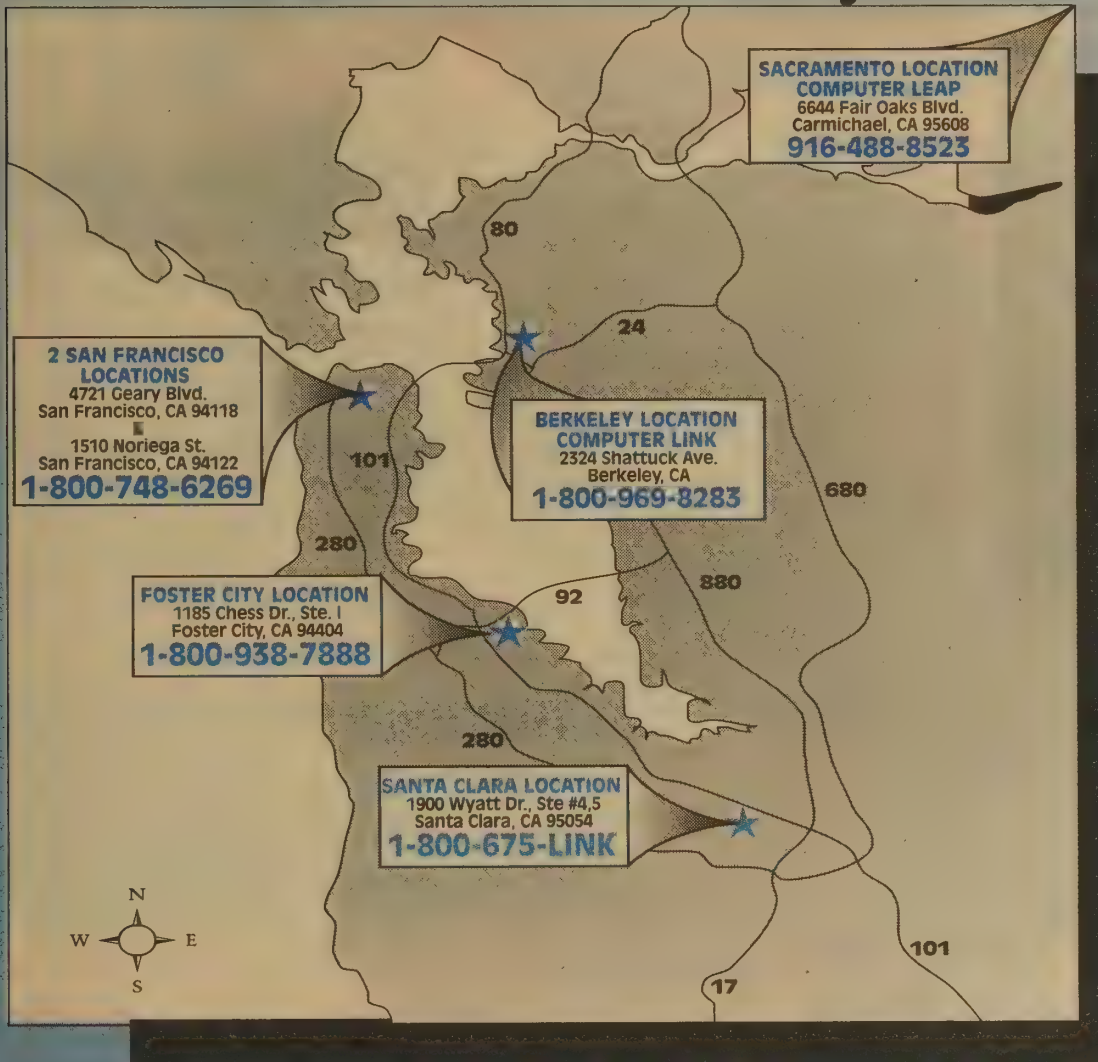
Many people here are saying, "I would like a better definition of how I should progress. Therefore, here is a job description at which I excelled, so do I get a promotion?" Without



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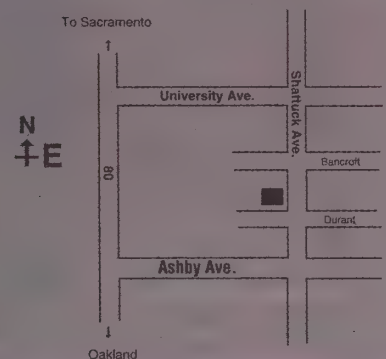
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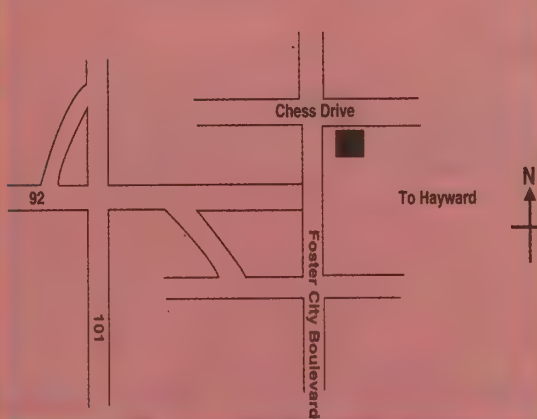
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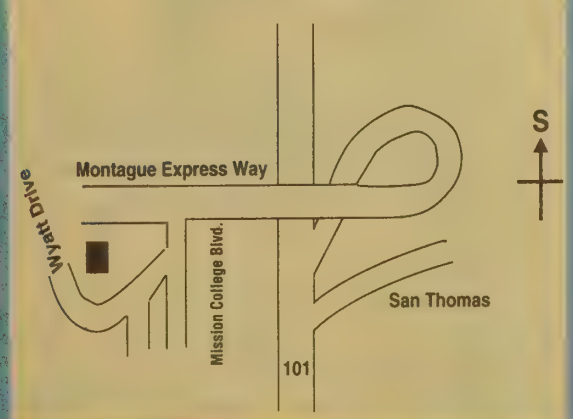
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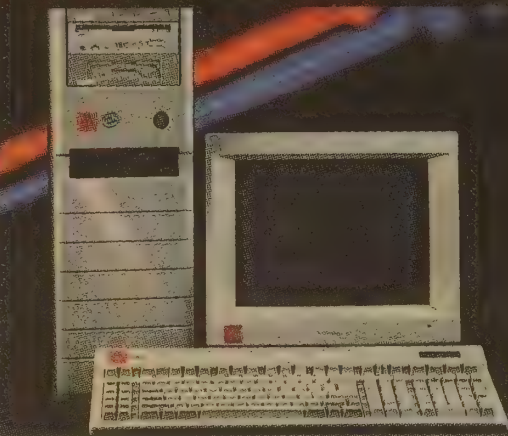
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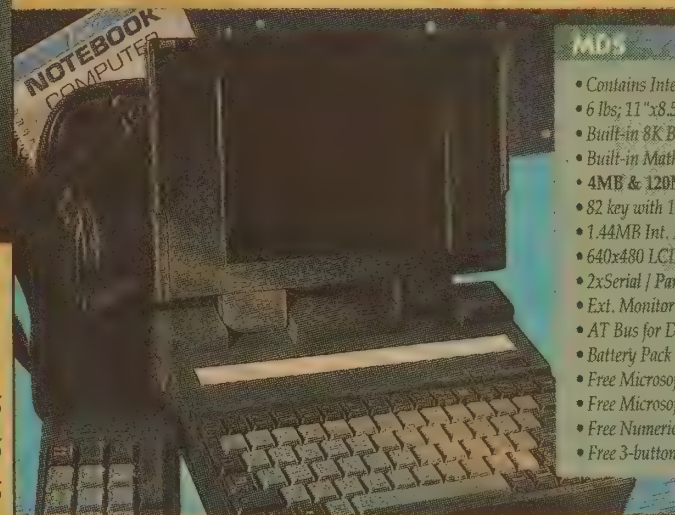
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that, there is always this nebulous question about "How does one get promoted?" "Where are the rules and where am I going?"

PROGRAMMERS AT AUTODESK HAVE BEEN DESCRIBED AS A THEOCRACY OF HACKERS, AND AN UNRULY CLIQUE. WHY IS THAT?

A lot of it made good ink.

It's always fun to take a company that has been public about its issues and try and pick the bones apart and say, "Exactly what is going on here, and what is unique?" In the absence of some set of rules and schedules, there has been a certain degree of freedom as to how things got decided, and therefore there was a hackers' society.

But all in all, people did have common goals in mind, they knew they had to get a release out. Maybe they were, in IBM terms, a little disorganized, but they still managed to do it. My view is, "With a little bit of structure and guidance, imagine how much better we would be."

WAS THERE ANY RESENTMENT ABOUT YOUR COMING IN FROM THE OUTSIDE AND BEING A WOMAN?

I didn't hear any critics, and if they are out there they haven't come forward.

On the outside issue, if there had been a clear internal candidate that had been passed over, then it might have been an issue, but there wasn't, so they had to have someone from the outside.

With regard to being a woman, in a way, maybe I am fooling myself, but I think they might be excited about having a woman. That might be very California, but I think they see me as giving them a uniqueness in leadership, and I get a lot of pride from that.

WHEN YOU ARRIVED, THERE HAD BEEN SOME INTERNAL CONFLICT IN MANAGEMENT. HOW DO YOU FEEL ABOUT THE SITUATION WITH JOHN WALKER STILL BEING VERY ACTIVE IN THE COMPANY, ALBEIT FROM A DISTANCE? DOES HE HAVE A VETO OVER YOUR STRATEGY?

John and I have an excellent relationship. He doesn't have jurisdiction; he is not a member of the board or the management team. He chooses to program in Switzerland.

But having said that, I value John's opinion very highly, and his vision.

He chooses to be very low key at this point. I think John had a great frustration at what was going on here, and I think he is willing to let new management prove itself.

I don't feel I have to prove myself to John

Walker. I don't believe that, and I don't think he believes that either for a second. But he is due his right as the principal founder and the visionary icon of the leadership.

IS HE STILL THAT ICON?

Probably not as much as he was. I think there is a lot of respect for John, his technical ability.

John himself would tell you he is not a

A lot of women get this idea that they must climb a mountain to prove themselves. That is nonsense. Find a valley, get around the mountain, and keep going.

public person. He doesn't like to manage. He could still be managing this place. When he stepped out of that role in 1986, he made it very clear that was not what he liked.

I think when he stepped out of it again—because, you know he came back to say, "Please fix the company"—the people really got the message. He really wants to be a programmer in Switzerland. Obviously he is involved in a great deal of the strategic direction, but from his position, rather than as a manager.

It is without question more normal for a founder to stay in a company, make a mess of it, and get thrown out by the board. You have to admire a man who says he doesn't want to manage. We really do complement each

other, because I don't want to sit and program.

We had a great deal of philosophical talks during the persuasion process and the interview process.

WHAT WERE THE MAIN SKILLS THAT YOU BROUGHT HERE FROM SUN?

I have a variety of backgrounds in sales and marketing; I have managed engineers, I have a computer science degree, and I have done programming. At Sun I had more than six thousand people reporting to me, in a worldwide, very complicated organization. I was clearly qualified for the job. Frankly, though, they wanted somebody with marketing vision and leadership qualities, and I had both of those.

[SUN'S] SCOTT MCNEALY IS VERY MUCH A MAN'S MAN, AND YOU WERE HIS #2. DID YOU HAVE ANY PROBLEMS WITH THAT? HOW DID YOU EARN HIS RESPECT?

Scott is a man's man, an avid golfer and hockey player. But he is also from a generation that went to business school beside women, has worked beside women, and his youth really balanced him on that issue.

Scott and I have a tremendous relationship, and it is based on severe frankness. I always told Scott exactly what I thought, and I think that while sometimes telling people what you think can cause distress, I think that over nine years Scott knew it was from the heart and in a professional sense, and often I was right. We developed respect for each other, and it grew over time.

You've got to understand, when we started the company nine years ago, Sun had less than 100 people and \$9 million in revenues. So we grew the company together with a lot of other people.

LOOKING BACK, YOU'VE SAID THAT YOU GOT PROMOTIONS BY PERSUADING THE TOP MANAGEMENT THAT YOU COULD DO THE JOB BETTER THAN YOUR BOSS. HOW DO YOU DO THAT WITHOUT MAKING ENEMIES AND CAUSING CONFLICT?

That sounds a little neat, and it is not exactly what I meant.

One proves they should get promotion by effectively doing that job. That doesn't mean you have to knock the boss off. The issue is that you do your job so well, and you are so capable, that you are already stretching onto another level. As opposed to people who sit and plot and say, "I must have this exact job," and don't pay enough attention to their work

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at hand. So they end up being average players at what they're doing, because they're always trying to get their careers charted out two and three steps ahead.

I didn't plan any of this. I am an achiever, and I tried to knock the socks off of any job I did. It was always obvious that I was ready for the next one.

WHAT ARE YOUR WEAKNESSES?

I tend to be impatient. I like people who will think quickly, who have a bias for action, and therefore I tend to be anxious with people who ponder too long, or fetch rocks—by which I mean the “fetching rocks” syndrome, or the “I couldn't possibly make a decision with the heaps of information that I already have, so I go out and gather more rocks.”

THAT'S NOT A WEAKNESS. THAT'S A STRENGTH, BECAUSE IF YOU DIDN'T HAVE THAT IMPATIENCE YOU WOULDN'T BE SITTING WHERE YOU ARE NOW, WOULD YOU?

I wouldn't. But on the other hand, I sometimes jump too fast and I cut them off, because they're going too slow, and I don't give them a chance to get up to speed. So it's a balance of giving people enough time to assure me they are going down the wrong path before I slide them over. I have to sit back sometimes and see what happens, and then once it has happened, at least the first time, say, “See, let's try it this way.”

I am especially sensitive about bringing in my new team here from other companies. They bring in different vocabularies and ways of talking about issues. Even when discussing strategic plans, people call them “visions,” “missions,” and all these terms. So I am trying to be very sensitive and let them describe what it is they mean, rather than assuming immediately what it is.

DO YOU THINK THAT BEING A WOMAN HAS HELPED YOU IN THAT?

Absolutely. I am convinced that female managers are capable of a much broader management style than men. I think they are much more tuned to listening to people, to having more sympathy and empathy—it's their nurturing side. They don't have a need to show such strong macho characteristics as some men seem to need to do.

I don't mean to generalize in either direction. I believe employees, as we go forward in this generation, are going to demand more of this in their managers. The old management style of “just do it because I said it” is archaic, and I believe women are more capable of making that transition. Men have to make the transition. I think, if allowed to get into the higher positions, women will prove themselves.

WHAT IS STOPPING WOMEN FROM ATTAINING THOSE POSITIONS?

In this country, the people that pick the CEOs and presidents are on the boards, and largely the boards are composed of older men who haven't had the opportunity to work next to women. When these men went to business school women weren't there, or when they went to engineering school women weren't there. It is easier for them to say, “Let's pick someone I know,” because they can relate to men.

It's going to take a couple of generations of these boards to roll over, because we need the Scott McNealys of this world to be on the board and say, “I'm comfortable with women running things, very comfortable, and therefore, it is an option.” The other men don't know it is an option.

DO YOU THINK THAT THE IT INDUSTRY IS PARTICULARLY ACCESSIBLE FOR WOMEN?

I think it was more so when I was coming up because it was so fast growing. Although the industry has not matured, it certainly has slowed in growth from the heyday in the '70s and '80s.

When I was coming through it didn't matter if you had the technical abilities, it didn't matter what sex or color you were, it just mattered that you got a job done. Everybody was digging the field before the rain came.

As growth slows, and the industry becomes more stable, you have the phenomenon that there isn't so much opportunity, so we will give the job to the people that we know, the white males!

WHAT ADVICE WOULD YOU GIVE TO WOMEN WHO ARE STRUGGLING TO GET THOSE POSITIONS IN ANY INDUSTRY SECTOR?

I guess the major piece of advice would be to do a good job and not get so hung up on how somebody might be treating you that second. That doesn't mean that you should accept blatant harassment or discrimination. If you are in a blatant situation, just remove yourself from that situation, go find another job.

I know that is easier said than done, but I don't believe that one needs to climb a mountain when one can find a valley. A lot of women get this idea that they must climb a mountain to prove themselves. That is nonsense. Find a valley, get around the mountain, and keep going. Do not be obsessed with the paranoia

of “Does somebody not want me here because I'm a woman?” Too many women spend way too much time on that issue rather than on their performances at their jobs.

Another thing—too many women get secure. They know their one thing and they feel secure. And so they are inclined to want to stay there, and management is inclined to

When I was coming through it didn't matter if you had the technical abilities, it didn't matter what sex or color you were, it just mattered that you got a job done.

want to keep them there. So they are in marketing, or finance, or personnel, or PR, etc. They are not inclined to the concept of taking a risk and jumping into another area, perhaps even at a lower level to get the experience.

That is a huge mistake. The broader one's base is, the greater the possibility the top of the triangle will be stable. If the base of that triangle is really small, the top of that triangle is going to be very difficult to achieve. If you have a large base of knowledge, in many different departments, and you make yourself very valuable, the step up to the top is a gentler slope.

When I got here, I was comfortable, because I had managed the various components along the way. So therefore I am comfortable making decisions. If you have only done one thing, how can you look back?

DID YOU HAVE NO FEARS OR APPREHENSION ABOUT WHETHER OR NOT YOU COULD HANDLE EACH JOB AS YOU HAVE TAKEN VARIED CAREER MOVES?

Each time I moved, I said, “My God, can I do this job?”

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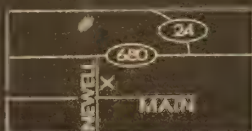
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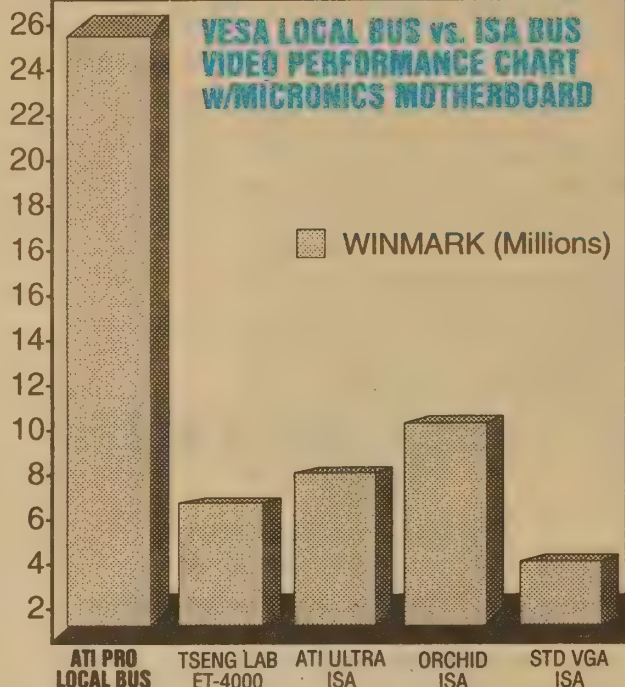


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are you doing, everyone?" And then listen. If you are grounded in some basic principles of management—listening before you act, and trying to understand the point of view of the customer and the company—you can do the mechanics of almost any job.

When I went into customer service, people were talking about life cycle times and statistics, etc.; I had known about it from the sales side, but it was very much a veneer knowledge. Once inside I realized I had to manage hundreds of people whose job it was to keep the equipment running. I had to learn to work with them and understand their problems.

I'll never forget when we had to do a circuit board upgrade because of some failures at Sun. Because of the way it was designed, it was impractical for my field engineers to handle. I could not get this through the vice president of engineering's head, so I went to him and I tried to demonstrate how the board could not be put in a packing box. I said, "Listen, I'm not an idiot, but I can't put this board in because there isn't enough hand space. We are scrunching this thing in there." Every time we were trying to push it down with a tool, we were damaging it. Basically I had to show the problem to get my point across.

Every time, I would just immerse myself in each of the businesses. And frankly, as I was ready to leave them I was very sad to be leaving because I was becoming very good. And then I was on to the next great experience.

It is very important to make those moves and it can be traumatic, but people have to make those moves, and have enough confidence in themselves to take that risk.

I have only been here five months, and I am still concerned about my performance. I know I can do the job, but I want to stay on my toes. I want to be a great CEO, and I think it is good to have some of that insecurity. There is a combination of confidence and insecurity that makes for excellence in whatever you're doing. If you are too confident, you are not looking at your weaknesses, and if you are too insecure, you can't get the job done. It's a case of deciding when you need to be confident and when you need help, and when it's time to ask someone to help you make a decision, because you don't know.

HOW DO YOU BALANCE BEING A WIFE, A MOTHER, AND THE CEO OF A LARGE COMPANY?

Balance is a word I reject. It is not possible to balance. I have a different theory—I just try to catch things before they crash. The problem with balance is that it has caused people, and women in particular, to get frantic.

Think about what balance means. It means perfection, tranquility. That is clearly not

possible in this crazy life. At some point you have to put extra effort into your home because a child is sick, or because a baby is due, a divorce is in the works—it can be anything in this society.

Then there are other times. For example, when I took this job I told my family, "I will see you in a year. The first year will be really difficult, and I am not going to have a lot of extra time, so I will see you in a year." I am clearly balancing, or unbalancing, my life towards work, and putting my family towards the back. They haven't fallen to the floor. And yet at times such as holidays, I think, "Okay, it is time to shut the company down, and concentrate on the family."

I believe that that philosophy takes a lot of pressure off me.

If I really tried to run out of here every day and have the exact perfect conversation with my daughter, and read her the six books every night, and iron a dress—I couldn't do that. That would turn me into a crazy woman.

ISN'T IT HARD WITH A FOUR-YEAR-OLD?

My daughter was raised thinking moms do my type of job. When she was three and a half months old I was commuting from Dallas to here every week, leaving every Monday and returning every Friday, leaving her there with Nanny.

She thinks moms go on airplanes. When she plays she says, "I'm going to the office." She gets her jewelry and her purse and briefcase and says, "I'm going to the office." I have my office at home, and she says, "Are we going to work now?" and she gets her pile of

zines, etc. She asks, "Where are you going on the big airplane?" It's not "Please don't go."

Here's a funny story to relate. A few months ago my husband Bill was taking her to Memphis, because he had to go on business and it is where his family lives. So he was taking her to spend some time with his family. She was getting all excited, and packed her Minnie Mouse bag. That morning she said, "Mama, will you cry when I go on the big airplane?" and I said, "No, I'm happy that you are going to go and have fun." When she was ready, I said, "Well, bye then," and she said, "I don't have time for that now, I'm late." She went charging out of the door with her dad. No hugs and kisses—she didn't care, she was off on the big airplane.

HAVING FOUND OUT ON YOUR SECOND DAY HERE AT AUTODESK THAT YOU HAD BREAST CANCER, HOW DID YOU COPE WITH WHAT WAS EXPECTED OF YOU HERE AND YOUR PERSONAL TRAUMA AT THE SAME TIME?

That was the hardest thing I did in my life.

While I was seemingly trying to get control of the company, I had this major personal attack. So I decided to get informational control of the cancer situation. Most of us don't walk around as cancer experts; in fact most of us like to ignore the subject, and rightly so. However, once you become a victim of this issue, my feeling is that you have no choice but to get as educated as possible as quickly as possible.

It's funny, now that I look back on the way

I don't feel I have to prove myself to John Walker. I don't believe that, and I don't think he believes that either for a second.

my trash and she gets me all mixed up.

I have two desks in the office, supposedly one for my husband [Sun vice president of Northern American and Australian Field Operations, William Marr] and one for myself, but she has taken over one, and I have the other. And, for her, the women go to work.

She doesn't know any better. Maybe one day someone will tell her that her mom is weird, but she thinks moms are in maga-

I went about it. I said, "What team am I going to pick—who is my surgeon, my gynecologist, my plastic surgeon? What information do I need to make a good decision, and what are the likely outcomes going to be?" It was exactly the way I went about dealing with the company.

I couldn't tell anyone, because it was actually insider information—the health of the chairman of a company is important to the public and stakeholders. I had to be very careful in the process of announcing it. For

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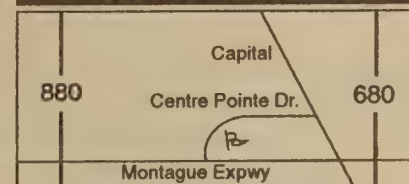
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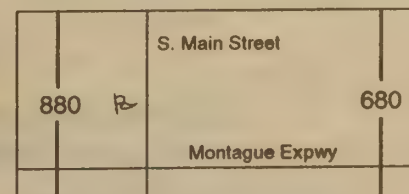
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basically five weeks only I knew, and my family knew. I was running to doctors' appointments, but in effect I wasn't gone for days at a time, and people weren't questioning where I was going. Then I concentrated on really marshalling up the public announcement strategy to make sure people believed the same confidence I had.

It was possibly the worst timing ever, actually. In retrospect, if it had happened sooner I might not have left Sun, because of the security I felt there. I would have fallen into the security trap we just talked about, and I'm sure I would have stayed. My support system was there; my friends were there; I knew my job cold, and I could take the summer off to get my health back.

But to some extent these things are meant to be, and when I started expressing those kinds of concerns, my husband said, "You made the decision for all the right reasons, and those reasons haven't changed." And he was right. Besides, you can't go back anyway. So that stopped me in my tracks, and I thought, "Why am I spending extra energy worrying about this? I need all the energy I have to cope."

Then it was the issue of how people would respond when you go to the public with something like this. I am very happy with my decision to go public, because primarily it is an enormous issue for women.

men, everything from "My wife had this, and I wish she had had your bravery," or "My wife had it and has lived, and we are both for you," or "I can't really relate to this, but I can relate to your courage." All those kinds of messages. It was very touching.

And you know, they timed it. They had weekly schedules, and I was gone four weeks; Week 1, a batch of things would come, then Week 2 another batch. I must have received 500 cards and 100 floral arrangements.

And I had fun. I was really ill, I had had twelve hours reconstruction surgery, but my daughter and I would wait for the mail. She got to open all the pink envelopes and I got to open all the others. The support that I got from a company I had only been at for five weeks was incredible. That was very surprising to me.

DID THAT MAKE A VERY PERSONAL AND FAST LINK BETWEEN YOU AND THE COMPANY THAT MIGHT HAVE BEEN ADVANTAGEOUS?

I think so. I didn't plan it that way.

Actually, the feedback has been just that. People really wanted to reach out and relate. I came in fairly open and direct anyway, so they already had that feeling, but I think this was such an amazing piece of information.

And I was very open with them, very open. Was it hard to be open? It was harder thinking about being it than doing it. The idea of how to execute it.

The way I ended up doing it was I had a major keynote

speech at A/E/C Systems Show in Dallas. It was scheduled for Autodesk, and I had postponed my surgery to give this keynote in front of one thousand people. I did that on June 9th, and then flew home and checked in for surgery at 5:30 the next morning. I gave the speech, then told the analysts and employees all on the same day. I did that purposely, rather than slink off. The last vision people had of me was this very dynamic woman, because breast cancer doesn't affect your brain.

That day was very orchestrated. Public mail went out here to all the employees; there were about two hundred employees at the show, and I held a meeting and said, "This is what happens, but you can't talk about it for four hours." I told the analysts, and said "Listen, I'm back on July 13th. I'm here—no problem. Let's not get overwrought on this issue." They couldn't try to make it a bigger issue than it was, because I didn't.

Looking back on it, asking, "Did I do this well?", I think in this particular case, I couldn't

have done it better, because it didn't allow the wags to get going.

ARE YOU 100% RECOVERED NOW?

No, I'm still in chemotherapy and will be until January. I elected to do chemo to be 100% positive. You don't have to do it, but it gives you an enormous insurance policy. Although in and of itself it is not easy for the next six months. I'm 44 years old. I have a long life ahead of me, so six months to ensure that there is not an issue later is worth it. It makes the job harder because it makes you tired and very sick, but it's not an issue. I have a very biased reaction to this decision of chemotherapy—it was an easy decision, it was nonsense not to do it, and I can make everything else fit in. To get back to my balance issue, so what if for six months I'm out of whack?

WHEN YOU LOOK FORWARD TO YOUR FUTURE AND AUTODESK'S FUTURE, WHAT DO YOU SEE?

I see a company that will be a world-leading open system design automation company. I think we will create a classic software company that can really deliver solutions to a wide range of technical markets that aren't office markets.

It's frustrating, because we tend to get lumped with Lotus and others, and that couldn't be farther from the truth. Part of it is because the company has allowed itself to be positioned there. I think you will see a new positioning of the company, and we will have our rightful place as a graphical engine, almost like an operating system company.

I don't want to use the word "Microsoft" because that would be very presumptuous, but we will be known as a solutions technology company in the design automation space. And I think there will be a lot of respect for us. I think we will be a good company to work for and a good company to do business with. I think they are components of the company in this decade. I think you have to be responsible, to all your stakeholders, your customers, your employees.

WHAT ABOUT THE FUTURE OF THE CAD MARKET?

By definition we already have some leadership in that area because of our market share. There is almost an Autodesk cult out there, and we have a responsibility to those people who have trusted us, and we have to maintain our leadership position, not only in design and drafting but also in these other areas I spoke of. I believe that is a responsibility we can step up to. ■

The old management style of "just do it because I said it" is archaic.

It is an issue that real women have to face, not just women in the entertainment industry. The women that tend to be public figures, other than Mrs. Thatcher, are women in the entertainment industry, and they don't really talk about it. If some real women doing real everyday jobs don't start pressing this issue and educating other women, and educating the legislative and medical systems on how to handle this, then it is never going to get better.

So I didn't want to become a crusader on this point because I have another job to do, but it is my responsibility to step out on this issue. The statistics are overwhelmingly bad, one in nine women. It is getting worse every year, and it has got to be stopped. You won't die from breast cancer if you deal with it.

DID YOU GET MUCH SUPPORT FROM THE COMPANY?

I got a tremendous amount of support from the company. I got thirty-foot banners with hundreds of signatures, and poster size get-well cards. I got some of the nicest notes from

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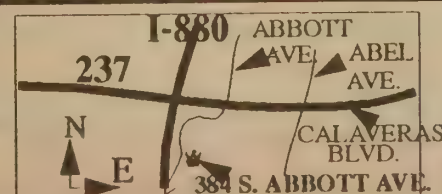
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The Autodesk Foundation

Business-Education Partnerships For A Changing World

BY MARY
EISENHART

A crowd of teachers and administrators gathers on a rainy day in October to hear an Autodesk Foundation-sponsored presentation by Bob Hughes, director of educational relations at Boeing, who describes global economic change and its relationship to their students.

"Texas Instruments," he says, "has a plant in Texas where they build silicon wafers. They cut out chips in a clean room. An entry-level job in that clean room in Texas requires two years of community college or two years of technical school.

"Texas Instruments has a duplicate plant just outside of Tokyo. The same job in the same clean room is filled by high-school graduates right off the street. So they're seeing two years difference in capability across the world."

Hughes is not engaging in yet another round of the popular sport of school-bashing. He's pointing out that US schools, in their current state, are not adapting quickly enough to the world in which their graduates find themselves. "It isn't that schools are bad," he explains, "it's just that they haven't changed as the environment of the kids coming in, and the kids going on into the workforce, has changed. It's becoming more and more of a shock to enter the workforce."

In point of fact, he says, the schools are doing an excellent job of what they were intended to do, based on the Horace Mann model that became ubiquitous in public schools early in the century. Based on the assumption that the vast majority of students would drop out in their teens and take assembly-line jobs performing repetitive tasks, and be supervised by the elite who made it through high school and college, the Mann model stressed passivity, rote learning, and steady attendance, and was highly effective at producing people as worker-modules.

In the meantime, however, the work world has changed. The automaton-like jobs of the traditional assembly line have, in large measure, moved offshore to cheap labor environments, or have actually been turned over to increasingly "smart" automatons. Whether in the factory or in the office, there is less and less need for employees as mindless, interchangeable parts.

Hughes cites a recent study in which a Swedish sporting-goods manufacturer was interviewed concerning the differences between his factories in Taiwan, France, Sweden, and the US. In Taiwan, the manufacturer said, the average person walking in off the street was educated well enough to work in the Henry Ford style of assembly line—a work breakdown structure where you do the same job fifty to five hundred times all day and pass it to the next person.

The problem, he said, is that the traditional assembly line is remarkably support-intensive—for every person on the line, the company needs four to six others handling cost accounting, inventory control, contracting, and general management and supervisory functions. Consequently he has many employees in Taiwan, and most of them are low-skilled and low-paid.

Now in France, the manufacturer found a better-educated workforce, so he took a different approach. He told them, "Here's what comes into your area. Here's what goes out. Everything in the middle is up to you. If you can produce that product cheaper, faster, better, maintaining the quality, it's going to increase profits." And the increased profits go to the workers.

Moved by this incentive, the French workers completely redesigned their workplace, even bringing in a consultant at their own expense. One worker had experience in cost accounting and took over that function. Another, unhappy with the quality of raw materials coming in, called up the vendor and renegotiated the contract. They instituted strict quality control at each step of the process. And within two years, they'd eliminated four out of six support positions and significantly increased profits.

The French method transplanted nicely to Sweden. However, when the manufacturer

tried to introduce the same practices at his US factory, "the people in America did not want to do cost accounting. They did not want to negotiate contracts with vendors. They were not comfortable writing contractual language. So they end up doing their job and going home. And from my point of view, they look just like the people in Taiwan, except the people in Taiwan are cheaper."

CHANGING WORLD, CHANGING SCHOOLS

Joe Oakey is the president of the Autodesk Foundation, a nonprofit organization created in 1990 to help bridge some of the gaps between education and the "real world." A longtime veteran of Autodesk, where he headed

Wealth is flowing to countries with the most competitive industries, and if our industry can't become more competitive, the wealth is going to continue to flow to other countries. If that happens, our standard of living continues to go down.

the company's education division, Oakey is an engineer, as well as a former teacher and principal, and spends a good deal of time visiting schools around the world.

"We're changing from a national to a global marketplace," he says. "Wealth is flowing to countries with the most competitive industries, and if our industry can't become more competitive, the wealth is going to continue to flow to other countries. If that happens, our standard of living continues to go down.

"Prior to this, it didn't make much difference what our schools did, because our industry, our value-added activities, could use non-skilled workers to produce. Now we need skilled workers. So the reason you see busi-



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ness so heavily involved in the push to change schools now is that businesses are looking for a different workforce."

Further, he adds, business in general is increasingly reluctant to simply throw money at the problem—"What a lot of schools say is, 'Just let the business give us the money and then step back.' That's what business doesn't want to do, because they've been doing it for too long."

The problem of bringing schools into a global and largely information-based economy is a formidable task, beyond the abilities of any single teacher, school, company, or government agency, and compounded by a general scarcity of funds. The Foundation seeks to facilitate partnerships between business and education, developing pilot projects that can be transplanted to new locations.

Paralleling the working world's evolution to flattened hierarchies and facilitator-type management, Oakey believes a key element in improving the "productivity" of the schools is making better use of their resources. "Teaching could change considerably," he says, "if we could get schools to adopt technology as part of the operational procedure of the school, instead of simply using computers to supplant the teaching role. If we use computers as the information tool, and kids begin to assume more responsibility for their own learning and do their own research for information, which has been the role of teachers for a long time, then the teachers can be released to do more of the higher-order things, with more kids, or with less expensive people as their assistants."

Another crucial factor, he says, is integrating the academic subjects into some useful context, instead of teaching them in the traditional, artificially isolated 50-minute periods which offer no synthesis and require incessant review.

EXPERIMENTS IN EDUCATION

In a pilot program at Marin's Sir Francis Drake High School, freshman and sophomore students spend four periods a day getting their math, science, social studies, and English in integrated form. "Those four teachers are a team," says Oakey, "so they can manipulate that time any way they want in the way they address content, using a thematic approach—they pick something for the kids to focus on and teach the content around that." This year, the thematic studies revolve around two subject areas—the recent elections, and the voyage of Columbus, seen from the dual perspectives of the European explorers and the indigenous peoples. Now in its third year, the program is a big hit with students and parents, and has a current enrollment of 120. "The plan," says Oakey, "is not to have a

school within a school constantly, but to start small and let it grow until eventually it is the entire school."

Starting this year, the Foundation is also developing the concept of specialized "academies" in the second two years of high school. Currently students at Drake can enroll in either a "communications academy" featuring drama, music, desktop publishing, interactive multimedia, etc., or a "pre-engineering academy." Other programs under development include a foreign language/international studies academy, a medical academy, and a financial/business academy. (For a related story, see "Case Studies: 'Academies' at Oakland Technical High School," issue #102.)

USING—AND GETTING—THE TOOLS

"We don't feel teachers can do this without a lot of support and training and development of curriculum and so forth," says Oakey. "They don't have the time to do that by themselves, so what we can do is bring in resources to do that for them. We sit down with them, identify the resources they need, go out and search for those resources..."

At a time when teachers commonly buy their classes' school supplies out of their own pockets, the investment in equipment required for these programs often seems prohibitive to the schools, however motivated. One of the Autodesk Foundation's tasks is to act as a liaison between the schools and prospective donors, from providing assistance writing grant proposals to using its industry connections to solicit donated or discounted hardware and software.

Perhaps more critical than the equipment itself, though, is the ability of teachers to put it to good use. Hence the Foundation also holds workshops to help the teachers understand the tools and integrate them into a new style of instruction. "The focus was not on the interactive multimedia there," Oakey says of a recent workshop. "The focus was on how you can learn something in a team, so you can all work together on it, so you know how to organize yourselves."

Beyond the pilot programs in place in elementary and high schools in California, the Foundation also offers other resources for strengthening the connections between business and education. For example, teachers can participate in an internship program at Autodesk itself, working in half-time jobs matched to their areas of interest, e.g. marketing or MIS. (This occasionally leads to episodes of cognitive dissonance. One teacher, Oakey laughs, was so startled by life in the private sector that she called her superintendent: "I've been here three hours. On my desk I have a telephone. I have a computer better than anything you have in the school district.

I'm on email—I can send email anyplace I want in the world, I can get email back from anyplace in the world. I can pick up the phone and call long distance anyplace I want to without permission from my principal. I've only been here three hours. I've been with the district six years and I don't have all of that yet. I don't think I'm going to come back to you.")

Another, broader-based project is intended to take advantage of the Internet, not only to allow currently involved teachers and students to communicate with each other and pool resources, but to develop more local connections between business and the schools.

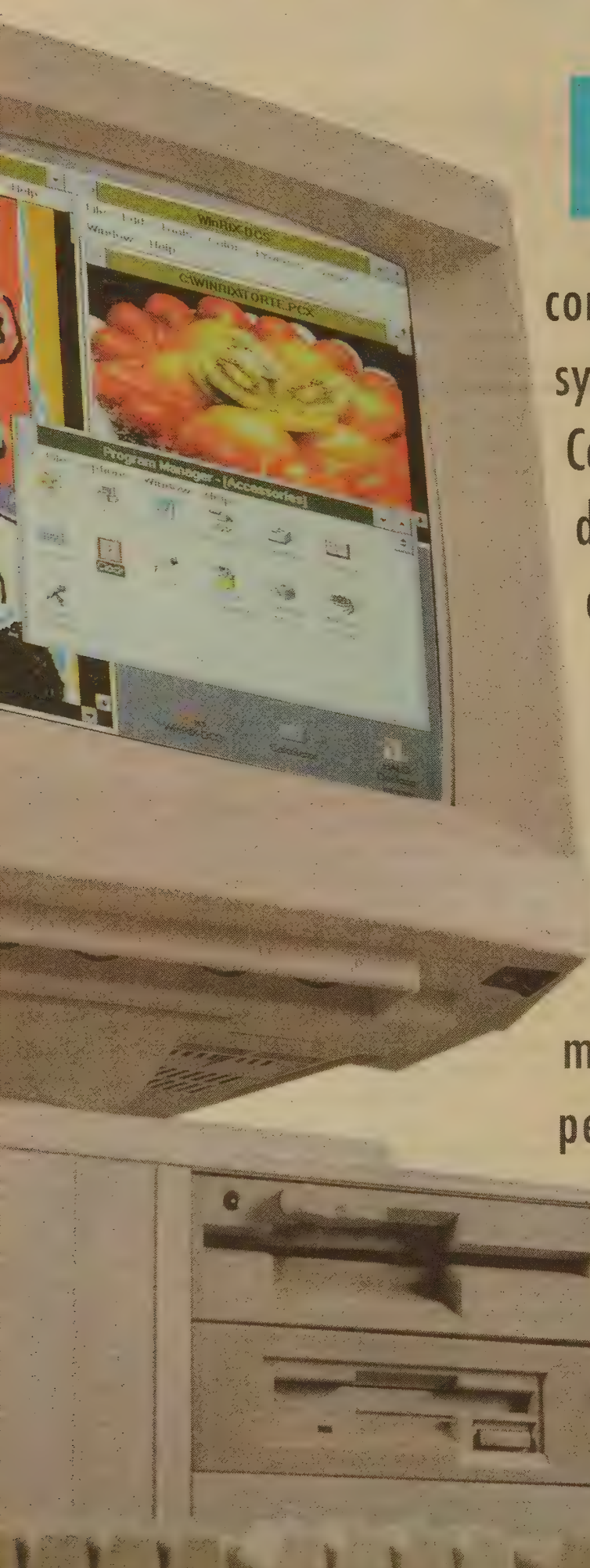
Says Oakey, "We're trying to create what we call tele-apprenticeships, where a kid can begin networking with a scientist in the field, or a writer in their field. Companies are willing to let their people work with kids, but in the normal structure the person has to leave their work and come to the school, and a lot of time is wasted. This way students can begin interacting with somebody who's a specialist in the field they're investigating without losing much time.

"What we're doing right now is appealing to companies around the Bay Area to give us a little money to allow us to put a modem and a telephone line and other things into the classroom of their choice. With some companies we're asking if we can have their Internet connection, so if they get a school in their community, it's a local call and the time on the line doesn't cost anything. Then our person will go and train that teacher how to get on the network and interact with the different services. Our hope is that slowly but surely we can build some data on how a lot of schools can network. That's the way I see that kids are going to work in the future, and we'd better start teaching them how to do it now.

"The federal government has mandated that at all of their research labs, the scientists should be available to elementary and secondary kids. So now what we need is to begin getting these kids more comfortable—get them on a project where they need that kind of advice, and start interacting with scientists by modem. We think this ought to be a common part of all schools."

All this, of course, is only a beginning; bringing schools and the outside world together requires cooperative participation from all sectors. Says Oakey, "Real and lasting change will come about only if many forward-thinking educators, business leaders, and community leaders work together in a spirit of cooperation and collaboration. We hope that our efforts will inspire other corporations, educators, and organizations to play an active role in transforming our education system." (The Autodesk Foundation, 415/332-2344) ■

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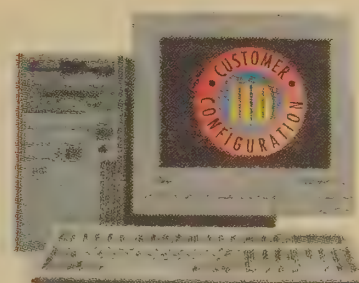
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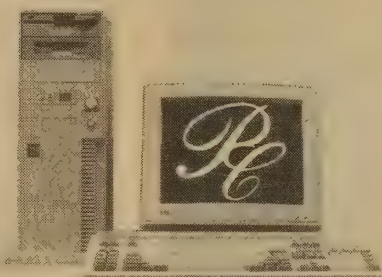
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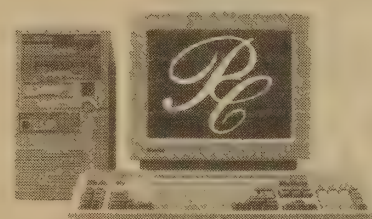
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TUTORIALS

Monday, January 18
9 am–5 pm

Integrating Windows Applications: Putting OLE and DDE to Work
Developing for OS/2 Version 2.0
Secrets of Optimizing Windows 3.1
Effective GUI Design
Tuning OS/2 LAN Server 3.0
Windows Programming with Visual Basic

Tuesday, January 19
9 am–5 pm

Designing and Building DLLs
Security Considerations for Windows 3.1 and OS/2 2.0
Secrets of Optimizing Windows 3.1
Programming for OS/2 PM Using IBM C++
Overview of Win32 Programming
OS/2 2.0 Performance Measurement SMP 2.0
Corporate Decision Makers Summit

CONFERENCE

Wednesday, January 20
9–10 am

Keynote Address: Michael Schräge

10:30 am–12 noon

The Real Cost of Migrating to Windows
Networking Windows: Promises vs. Reality
User Experience in Building Enterprise Productivity
Crystal Ball Session: Industry Experts Predict

GUI's Future
Windows/PM Developers Round Table, Part 1
MPC—Too Little, Too Late?
Introducing OS/2 2.0, Part 1

2–3:30 pm

Client-Server Computing: From Traditional to Emerging Solutions
End User Data Bases
The Great LAN/NOS Debate
Cashing In on the Windows Marketplace
GUI Migration Tips & Techniques
Multimedia Board Shootout
OS/2 Tips & Techniques, Part 2

4–5 pm

IBM Strategy Briefing

Thursday, January 21
9–10 am

Plenary Session: Fred Langa

10:30 am–12 noon

Windows-OS/2 Training Issues
A Windows Desktop Publishing Shootout
Security Concerns of Windows-OS/2 in the Networked Environment
The Great Operating Systems Debate
Windows/PM Developers Round Table, Part 2
Software Motion Video Standards
Running DOS & Windows Applications, Part 3

2–3:30 pm

Corporate User Support Issues

Building the Ultimate Windows PC
Strategic Networking Issues: 12 Months to 3 Years Ahead
What's Hot & What's Not in Windows and OS/2
Developing a Common Application for OS/2 and Windows
Multimedia and Mainstream Business Applications
Installing and Configuring Windows, Part 1

4–5 pm

Microsoft Strategy Briefing

Friday, January 22
8:30–9:30 am

Developer's Keynote: Gordon Eubanks

10–11:30 am

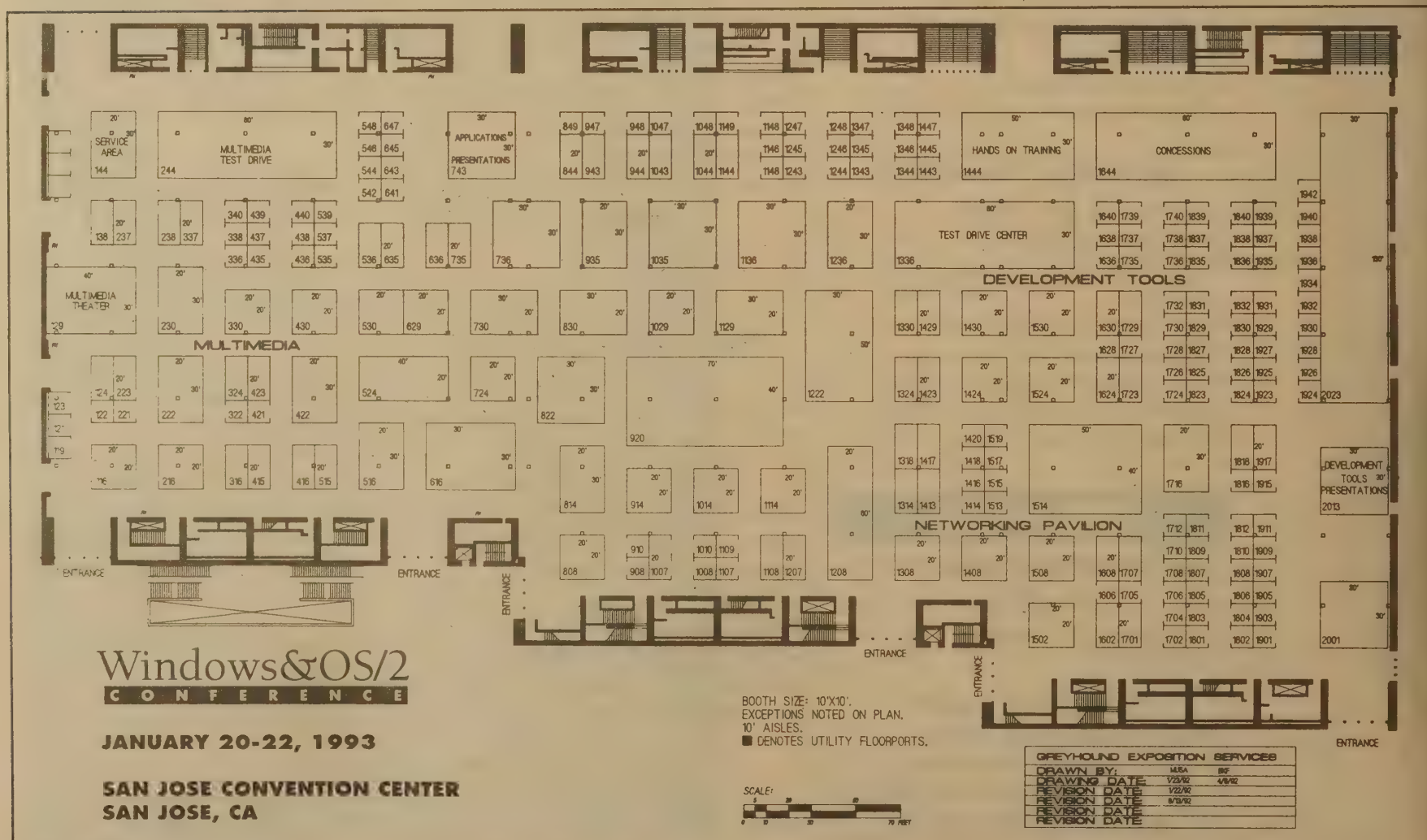
The New Corporate View of Workgroup Applications
Personal Information Managers (PIMs) for Windows
Wireless LAN
Emergence of the Groupware Market
Testing GUI Applications
Networked Multimedia: The Promise and the Reality
Installing and Configuring Windows, Part 2

1:30–3 pm

Distributing Data and Applications Under Windows and OS/2
Windows Word Processing: A Look at the Contenders
Selecting a GUI Development Strategy
Visual Programming Languages

Preliminary Exhibitor List

Ace Software Corp.	Workshop	GFA Software	Media Vision, Inc.	Qualitas	Systems
ACECAD, Inc.	Citrix Systems	Technologies	Mercury Interactive	Rainbow	Valley Micro
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Advanced Computer Systems	The Cobb Group	Halcyon Software	MicroTimes	Sierra Semiconductor	VideoMail, Inc.
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built-in send/receive fax modem, credit card-type security system, and docking panel are available options. (\$2999) Wedge Technology, Inc., 1657 McCandless Dr., Milpitas, CA 95035. (408)263-9888.

SAGER NP-209 NOTEBOOK

The NP-209 is a fast, powerful, 486DX2/50, ISA-compatible notebook. It comes standard with 4MB of RAM, expandable to 16MB, a 120MB hard drive, 3.5" 1.44MB floppy drive, two serial and one parallel port, a 15-pin extended video port, ports for an optional external numeric keypad, a full-size keyboard connector, and an AT-Bus docking station. Its rechargeable NiCad battery pack requires less than two hours to recharge and lasts for more than two hours when fully charged. The NP-209 ships with MS-DOS 5.0 and Windows 3.1 installed, a deluxe carrying case, and notebook utility software that simplifies power consumption

management. Sager, Inc., 18005 Courtney Ct., City of Industry, CA 91748. (818)964-8682.

PRODUCT UPDATES

- Above Software has introduced a special edition of Golden Retriever for members of computer user groups. The special improved edition is priced at \$59, a 40% savings for members of user groups if purchased by February 15, 1993. Above Software, Inc., 2698 White Rd., #200, Irvine, CA 92714. 1-800-344-0116.
- Aldus announced a free accessory pack for Aldus PhotoStyler that includes full support for Eastman Kodak's Photo CD technology. Aldus Corp., 411 First Ave. S., Seattle, WA 98104-2871. (206)622-5500.
- Autodesk's Multimedia Division released Autodesk Animator Pro 1.3, the upgrade to its 2-D paint and animation software package. Animator Pro 1.0 owners can upgrade for \$199. Autodesk, Inc., 1-800-525-2763.
- Avantos Performance Systems released ManagePro for Windows v1.2. Avantos Performance Systems, Inc., 5900 Hollis St., Suite C, Emeryville, CA 94608. 1-800-282-6867.
- Cadkey announced a series of new CADKEY bundles and prices and a trade-up offer. Cadkey, Inc., 4 Griffin Rd. N., Windsor, CT 06095-1511. (203)298-8888.
- MapInfo introduced StreetInfo v2.0, a new data file for street-level maps of the US that are attractive, easy-to-use, and rich in geographic detail. MapInfo Corp., 200 Broadway, Troy, NY 12180. 1-800-327-8627.
- Santron Computer announced a new, comprehensive VIP Customer Service program. This program is designed to provide a new level of customer service to corporations, government and military organizations, educational institutions, exporters, and resellers. Santron Computer, Inc., 1185 Chess Dr., Suite 1, Foster City, CA 94404. 1-800-748-6355.
- Shiva is bundling Magnet, from No Hands Software, with its LanRover/E for AppleTalk Remote Access. Shiva Corp., One Cambridge Center, Cambridge, MA 02142. 1-800-458-3550.
- WordPerfect is shipping WordPerfect Presentations 2.0 for DOS. All retail packages of WordPerfect Presentations will be bundled with PC-Kwik, a disk caching program that enhances product performance. WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057. 1-800-225-5000.

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PRODUCT SPOTLIGHT

REVIEWS

GAME REVIEWS

By Mike Markowitz

ZUG'S RACE THROUGH SPACE

Designed By: Thomas Cardin, Jr.

Published By: First Byte

For: MS-DOS (640 K; Super VGA, VGA, or MCGA graphics; mouse and audio card highly recommended)

List Price: \$34.95

The place is the solar system; the time is the future. Manned orbital observatories circle all the planets, but in a design oversight worthy of NASA, they were built without kitchens. Zug and M-Kar, a pair of wisecracking cartoon characters, come to the rescue with their Dinosaur Delivery Service. Your job is to help them figure out clues that indicate which planet gets the next hot meal. Clues consist of facts about the planet. For example, "Three-quarters of their planet's surface is ocean," would tip you off to Earth as your destination.

Your base of operations is the Astrocenter, where you can pick up food, obtain clues, and park your spacecraft in the garage to save a game. While traveling you encounter hazards like hyperspace traffic jams, Space Cops, and fierce competition from Mr. Bronto's greasy Bronto Burgers. Some of the animated special effects (traveling through hyperspace or moving between sections of your space station) are spectacular.

You can run the program using synthesized speech, text balloons, or both. First Byte's patented text-to-speech technology delivers a robotic voice even on systems without an audio card, though the sound volume is quite low. There are multiple levels of difficulty, but the user interface is quite simple. Zug's Race Through Space is designed for ages 5-12. The autopilot in your spacecraft has an endless supply of knock-knock jokes, which still appeal to this age group.

The program is installed from five 3.5" disks, and takes up about 5MB of hard disk space, due to the extensive sound and graphics files. For each planet there is a full-screen, high-resolution digitized photo, such as the spectacular Voyager images of Jupiter and Saturn. A 28-page user manual provides the background for the story line and clear instructions.

Our only criticism of Zug's Race Through Space is that the content is too thin. There are only eleven possible destinations: nine planets, plus the sun and the asteroid belt. This is not enough variety to

maintain interest over many playings. It's a big universe, and with hyperspatial drive you should be able to visit some of those stars, nebulae, and galaxies that we can rarely see anymore in the urban night sky. (First Byte, PO Box 2961, Torrance, CA 90509. 1-800-556-6141)

SPACE ADVENTURE

Designed By: Bill Gross

Published By: Knowledge Adventure

For: MS-DOS (640 K, VGA or SVGA graphics, mouse and audio card recommended)

List Price: \$79.95

The programmers at Knowledge Adventure have been pushing the state of the art in file compression for high-resolution color imagery, making it possible to store a lot of photo-realistic pictures on your hard disk and display them almost instantly. This neat trick is built into a hypermedia "engine" that lets you move around in time and space with graphics, text, and sound to explore connections between people, facts, and events. They call it "multimedia without a CD-ROM."

With Space Adventure they have taken a giant leap for Mankind by developing a proprietary technology for compressing full-motion video. The program includes seven video clips—100MB of data!—scrunched down to about 1.2 MB. The results are slightly grainy and a bit jerky (at ten frames per second), but they compare very favorably with Apple's QuickTime movie technology seen on a Macintosh.

Space Adventure consists of over three hundred screens that document the history of astronomy, space exploration, rocketry, and related topics. Much of the text was written by Tom McDonough, a lecturer at Cal Tech. Astronaut Buzz Aldrin helped review the material on the US space program.

Each screen consists of a graphic window (about a quarter of the screen), a scrolling text window, a time line indicator, and a wonderful globe that highlights the location of the event. You can rotate the globe,

zoom in or out, or expand it to a full screen. Click anywhere on the globe and the program jumps to the nearest event. There are well-designed on-screen buttons for every function and category of

information. There are also pop-up explanations of details in many of the graphics (similar to Balloon Help on the Mac). For example, in a group picture of several astronomers, you can point to an individual and a pop-up balloon will identify the person.

The program is installed from compressed files on five high-density disks. While you're waiting, the installer displays a series of informative screens describing the features of the program. After installation, Space Adventure occupies about 8MB of hard disk space. On-screen help is so comprehensive that most users will never need to open the slim *User Manual*.

Space Adventure is the fourth package in a series; the others are Knowledge Adventure, Sports Adventure, and Science Adventure. Future titles will

Graphics and
Animation: 9
Sound: 9
User Interface: 8
Overall Value: 7

Graphics and
Animation: 9
Sound: 9
User Interface: 9
Overall Value: 9

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PRODUCT SPOTLIGHT

include Dinosaur Adventure. The programs have a common "engine" but each is a standalone application. The engine is a surprisingly compact 150K executable. An authoring program that will allow users to create their own screens is under development.

Anyone who wants to see excellence in the design and implementation of educational hypermedia should check out Space Adventure. (Knowledge Adventure, Inc., 4502 Dyer St., La Crescenta, CA 91214. 818/542-4200)

DARKLANDS

Designed By: Arnold Hendrick

Published By: MicroProse

For: MS-DOS (640K, VGA graphics, mouse and audio card recommended)

List Price: \$69.95

Darklands is an ambitious attempt to make a fantasy role-playing adventure "realistic." Instead of the usual homogenized alternate reality cribbed from J.R.R. Tolkien, the game is set in Central Europe during the fifteenth century. The designer has tried to present the fifteenth century world as people of that era experienced it, with folklore and popular superstition a part of "reality."

You lead a party of four adventurers, who travel from place to place in quest of glory, virtue, knowledge, holy relics, and gold florins. This is an open-ended adventure; there is no single objective or puzzle to solve. The elaborate character-generation system creates unique individuals with a variety of strengths and weaknesses.

The game map covers Germany and surrounding areas north of the Alps, from the Netherlands to Poland, including major towns, castles, and trade routes. You move across the map by simply pointing to a destination, and the program works out the route. Given the poor state of the roads, travel by water is often the best option, but you risk encountering river pirates.

Each city has a variety of locations where you can

lodge, seek information, go shopping, or get into trouble.

Combat is a basic feature of the game. Every imaginable weapon, from crossbow to halberd is modeled in the game; including crude early handguns (but not the Holy Hand-Grenade of Antioch). Better weapons and armor are extremely expensive. A major source of income is selling the equipment of defeated foes. Characters are rated according to their strength, endurance, agility, and skill with each weapon category. When you tangle with bad guys, you must decide where each character will stand and which enemy he will fight; the program then displays a blocky, low-resolution animation of the battle, flashing numbers to indicate the severity of each wound.

Alchemy and religion are major sources of power in Darklands. If you have the skill and can collect the esoteric ingredients and formulas, you can mix up anything from a simple stink-bomb to a powerful healing potion. You can pray to over one hundred saints, with their proper attributes and feast days. If you have accumulated enough merit, bagged a powerful holy relic, or donated generously to the

Graphics and Animation: 7
Sound: 7
User Interface: 7
Overall Value: 7

right monastery, prayers may actually work miracles. The designer's notes emphasize that the corrupt medieval Church represented in the game bears no resemblance to today's Roman Catholic

Church. He also includes a diplomatic disclaimer: "The region depicted in the game, Greater Germany, is not intended to be a justification for German expansion into neighboring countries."

A variety of musical themes set the tone for each scene, and there are lots of combat sound effects.

Darklands is a huge program: about 17MB after installation from eleven high-density disks. A long, melodramatic, and rather unnecessary opening animated sequence contributes to this extravagant demand for storage space.

The 104-page manual is attractively designed, well indexed, and includes a good bibliography. There is also a quick reference card and a colorful reference map.

Most of the artwork in the game is excellent, but it loses points for the jaggy combat animation. Although the menu-based interface is fairly clean, some of the character status and inventory displays

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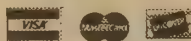
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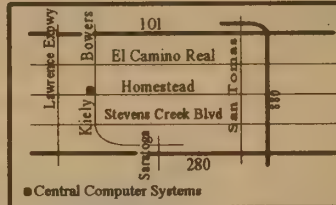
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Jet Ram Memory for HP I1P, I1P+, I1I1,I1IP,I1ID 75/115/155/195

LASER MASTER
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WinJet 800 800dpi, Postscript adapter
for HP I1I,I1ID,I1I1,I1ID 599
WinJet 1200 Postscript for HP 4 799

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512K, 45dBA 1125
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HP-GL Emulation Card 325
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ink cartridges 19.50

PANASONIC
1180i / 1123 158/199
1124i / 1624 285/349
Auto sheet feeder for 1124 only KX-P36 120
2123 24 pin, 43.5dBA, color capability 239
2124i 24 pin, 43.5dBA, color capability 319
2180 9 pin, 45dBA, color capability 159
2624 24 pin, quiet printer 46.5 dBA 375
Color upgrade kit KX-PCK11 49
Single bin cut sheet feeder KX-PT10 95
32K Buffer dot matrix printers KX-P43 65
Serial interface card PS-13 75
4410 Laser, 512K, 5ppm 625
1MB mother Ram board KX-P444 115
1MB daughter Ram board KX-P445 99
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Developer KX-PDP4 105
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Optional Second Cassette KX-P495 135
Toner KX-P453 35
Fonts Card KX-P47x (for Laser Printers) 95
4430 Laser, 1 MB, 5ppm 885
Accessories same as 4410

4420 Accessories
RamBoard 1MB / 2MB / 4MB 99/139/219
Developer KX-PDP2 95
Drum KX-PDM2 99
Envelope Tray KX-P431 59
Legal Tray KX-P425 45
Ozone Filter KX-PFT2 26
Toner KX-P451 39
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RamBoard 1MB 139
others same as 4450i
4450i Laser, 11ppm 1095
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Drum KX-PDM1 145
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Legal Tray KX-P420 45
Ozone Filter KX-PFT1 29
Toner KX-P450 35
4455 (Postscript) 11ppm 1695
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others same as 4450i

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Ram Board 1MB 69

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COMPUTER PERIPHERAL
Jet Page (for HP I1I) 195

GENESIS
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Super Cartridge 2 & 2LC 269
Super Cart. 3 Pro+ for HP I1I,I1ID,I1IP,I1ISI 249
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Pacific Page & 2MB (Postscript for HP I1I) 389
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Cable (2 Floppies & tape back up) 9
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VGA Stereo 512K w. speakers 239
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Fahrenheit 1280 (DRAM) 1MB 169
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ProDesigner IIs, 1MB, Hi-color for MCA 335

UNITED SOLUTIONS
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Happy New Year !

are confusing. Darklands should appeal to a wider audience than most fantasy role-playing games. Medieval history buffs (like those guys in home-made armor you see at the Renaissance Fairs bashing each other with sticks) will love it. (MicroProse, Inc., 180 Lakefront Dr., Hunt Valley, MD 21030. 410/771-1151)

MACINTOSH SOFTWARE REVIEWS

GRACELAN ASSET MANAGER

Published By: TechWorks

List Price: \$895

Reviewed By: Matthew Leeds

In my day job I work for a major software publishing company. Part of my responsibility there is managing the corporate network of several hundred computers and several hundred computer users. Keeping track of their systems, the software installed on them, the memory and hard drive sizes, the versions of operating systems they use, and all of the other details sometimes seems unimportant. At least until you have to solve a problem for them, or decide on how many upgrades to purchase for a particular application used in the company, or report on just where the last three new computers purchased were installed.

Asset Manager is a relational database built on 4th Dimension. It uses information collected by TechWork's Network Manager to profile and inventory the hardware and software installed on a Macintosh network. You still need to enter additional information such as serial numbers, purchase price, etc., if you want to track it.

Once you've collected the required data you can pull up information on any system, check the hardware configuration, see what version of software a person is using, track depreciation on hardware and software investments, and print out reports on any or all of this info.

Asset Manager makes the job of keeping track of what's been bought, installed, and added to the ever-growing collection of hardware and software at our company easier. It provides a central point of information and

Continued

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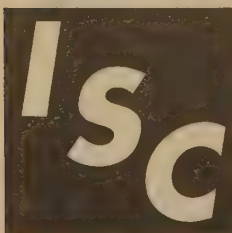
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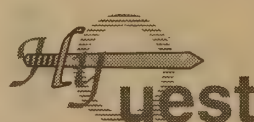
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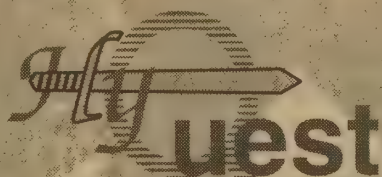
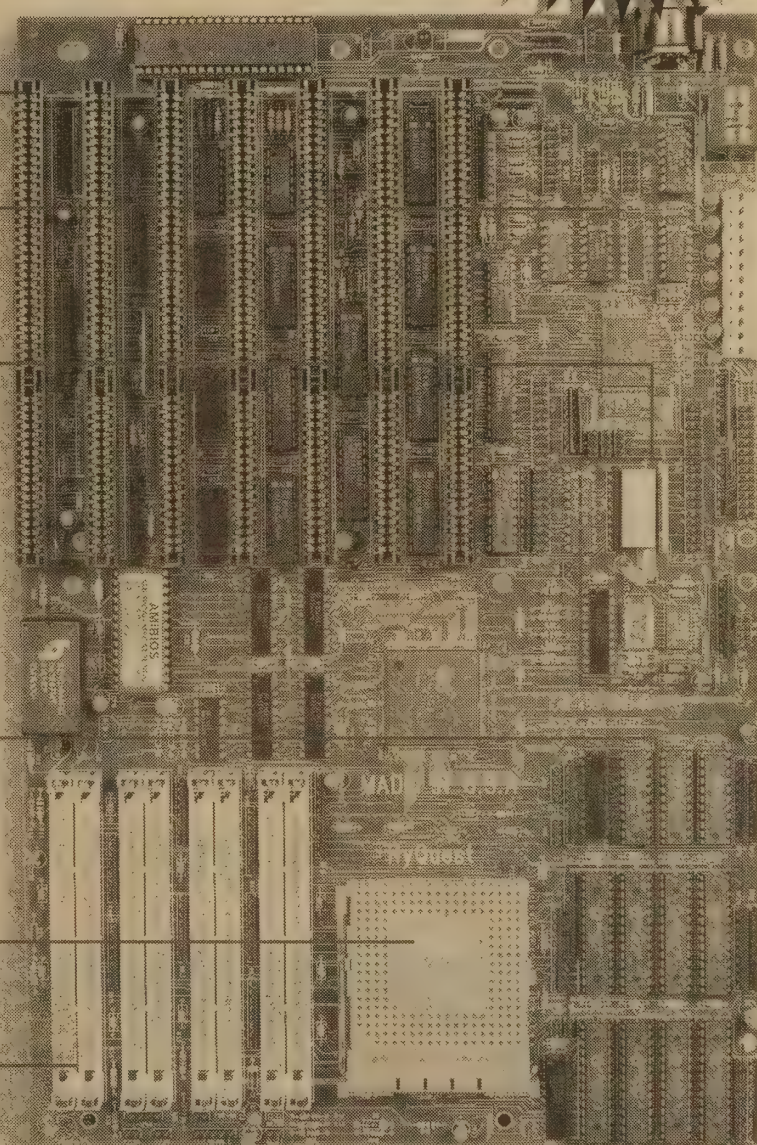
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PRODUCT SPOTLIGHT

offers a framework for managing data. You'll still need to spend a lot of time keeping it up-to-date, and currently it has no interface to any of the DOS programs that collect similar information over the network (this is essential in a mixed hardware environment). (TechWorks Inc., 4030 Braker Ln. W., Ste. 350, Austin, TX 78759. 1-800-688-7466)

QUICKEYS 2.1

Published By: CE Software

List Price: \$149

Reviewed By: Matthew Leeds

Computer users are creatures of habit. We do the same things over and over again: cutting and pasting addresses from a phonebook program to a letter, running three different Photoshop filters on an image, or remembering to run a backup of our data files. Computers were supposed to free us from repetitive tasks, and instead they seem to have exponentially expanded them.

Enter QuicKeys, the macro program from CE Software. QuicKeys can watch what you do and remember it, then repeat it. You can teach it to do just about anything. The macros you create can be edited and modified if needed. Macros can be assigned to hotkeys or as menu items.

This latest version of QuicKeys is System 7 savvy. It understands aliases, has balloon help, lets you cycle through open applications, handles Apple Events, lets you add comments to your macros, and is 32-bit clean. It also provides extensions to Apple Events that let you send Apple Events to other Macs on a network and to the Finder. It can also communicate with UserLand IAC aware applications like Frontier. No power user should be without it. (CE Software, Inc., 1801 Industrial Circle, PO Box 65580, West Des Moines, IA 50265. 515/224-1995)

PROART PROFESSIONAL ART LIBRARY PORTFOLIO CD-ROM

Published By: Multi-Ad Services

List Price: \$595

Reviewed By: Matthew Leeds

The ProArt Professional Art Library Portfolio CD-ROM is a collection of clip art in EPS format. The CD contains over three thousand pieces of art in more than fifty different categories. All of the art is line art, there is no color art included. The collection is indexed via Multi-Ad's Search program, in my opinion the best indexing and retrieval system for graphics on the Mac. The CD includes a run-time version of Search. It lets you search for the right piece of art via keywords, provides a quick thumbnail preview of each piece of art, and can display any piece of art full-size.

System requirements are minimal—CD-ROM drive and 2MB of memory. The artwork is very traditional, almost antique in nature. While it won't win any awards for being chic, the contents are serviceable for most applications. The price is a bit high compared to other clip art collections on the market, but the added value of being pre-index via Search may make the additional cost worthwhile. (Multi-Ad Services, 1720 W. Detweiller Dr., Peoria, IL 61615. 1-800-447-1950)

VERBUM INTERACTIVE CD-ROM MULTIMEDIA MAGAZINE ISSUE 1.0 MAC EDITION

Published By: Verbum

List Price: \$49.95

Reviewed By: Matthew Leeds

There are certain products that become icons: lava lamps, PEZ dispensers, metal vegetable steamers, Corvette Stingrays. Some are functional, some not, some affordable, some not. They mark a point in time and in technology. The Verbum Interactive CD-ROM is such a product. It is both troublesome

Continued

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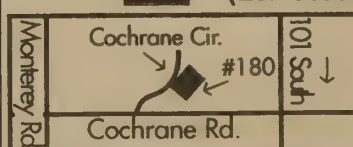
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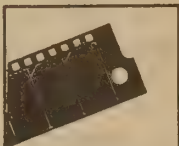
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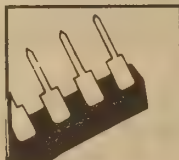
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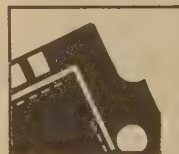
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PRODUCT SPOTLIGHT

and seminal.

It is troublesome because only a few will be able to afford the hardware required to use it. You need a color Mac with a late-model CD-ROM drive, at least 5MB of memory (and 8MB if you want to see everything), a pair of external speakers, and at least System 6.0.7. It is also troublesome if you accept its definition as a magazine since its development was funded in part by outside parties, and the advertisements are not clearly labeled as such.

It is seminal because it pushes the boundaries of multimedia products. There has been lots of discussion of the potential of interactive multimedia technology, but Verbum Interactive delivers. The tutorial on Photoshop is an excellent example of computer-assisted learning, the interactive feature stories on cyberculture and multimedia marketing have an impact that a story in a print magazine or on television could never deliver.

This stuff still has a long way to go. "Reading" Verbum Interactive requires lots of patience as there are long delays each time a new segment is loaded from CD-ROM. The occasional excesses of artistic expression may distract you as they did me, but one person's excess is another person's pleasure. Verbum plans to offer a quarterly subscription service with versions for MS-DOS/Windows, CDTV, and CD-I to follow. (Verbum, 670 Seventh Ave., 2nd Fl., San Diego, CA 92101. 617/233-9977)

PC SOFTWARE REVIEWS

PC-SIG LIBRARY CD-ROM 11TH EDITION

Published By: PC-SIG

List Price: \$179

Reviewed By: Matthew Leeds

Shareware has always been a rich source of programs and clip-art. Finding the best shareware, including documentation, has been more of an art than a science. PC-SIG has collected over 800MB of the best shareware, stored most of it in compressed form, included a hypertext index, and checked each program for viruses. It's all available on this latest edition of the CD-ROM.

While the list price for this CD-based collection may be high for some users, shareware is an excellent alternative for small businesses staring at thousands of dollars in startup costs to purchase software as they computerize. Shareware fees are typically 10%-30% of commercial software, and having the original distribution on CD insures that the master disk is never infected or overwritten.

The hypertext index supports both keyboard and mouse interfaces. Screen dumps of many programs are available to allow inspection of the user interface without the bother of running a program. Decompression and copying is handled automatically by the index program. The index is easy to navigate and straightforward to use. (PC-SIG, Inc., 1030-D E. Duane Ave., Sunnyvale, CA

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Passport Producer

A New Entry-Level Approach To Mac Multimedia

BY TONY
REVEAUX

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For over ten years, Passport Designs has been renowned for its computer-aided music composition, notation, and MIDI software, mostly for the PC. Now it has added another stanza to its score with Passport Producer, a time-based multimedia integration program for the Macintosh.

Producer is not the be-all and end-all of multimedia. However, it represents a significant step in bringing what we can do on the desktop to the level of the professional world of media production. It is also getting good reports for being an easy-to-use presentation program environment for novices.

WHERE'S THE SMPTE?

"SMPTE" is a set of time code standards for the synchronization of picture and sound, defined and coordinated industry-wide by the Society of Motion Picture and Television Engineers. SMPTE is to film and video producers what PostScript is to graphic designers and publishers. As long as Apple has been providing multimedia solutions, the continuing Mac-complaint I've heard from media producers is "Hey—where's the SMPTE?"

Producer is not a true authoring program, so we aren't quite into the Full Hollywood yet here. It is driven by a linear, rather than a hypertext, continuity. That means that unlike HyperCard or even MacroMind Director, Producer is not intended to be an interactive, random-access solution, but it's the next best thing. It can integrate and coordinate different playback elements that may have been authored in many different media environments. It traffic-cops text; graphics; animation; QuickTime Moovs; and analog, CD, and MIDI audio. These are all translated into cue modules which can then be "cue processed"—cut, pasted, and modified—as columns into a predictable time-based document.

The Cue Sheet is the document. You can choose the time base formula of real time, or

the various flavors of SMPTE. Producer does not have device control like Macromedia's MediaMaker, but it can run these cue-based documents in clockwork-smooth presentations and print the file out to video.

RUNNING PRODUCER

Producer will run with System 7 on any 68030- or higher Macintosh, including PowerBooks and Quadras. Producer uses a default memory partition of 4000K; when using 24-bit color

view in MacroMind Director—is made up of the time and the track columns. It and the three other menu bars, Transport for control (similar to Director's), time Counter, and media modules, are all tear-off menus.

The Stage (as in Director) is the window for all of the visuals. You have to configure the screen position with the Stage Setup window, and then return to the desktop. To get it just where I wanted it took three or four go-rounds, but it's a good approach. It provides you with the Mac's monitor window, which in my case

The ability to expand a presentation up to eight tracks in any combination of media is very important, and not available in any other program with this synchronization.

you should make available a minimum of 8MB. Fortunately Producer is portable, and will run on a black-and-white PowerBook with as little as 1500K.

I found using the tutorial a good way to spend an hour or two learning the capabilities of Producer. It includes samples, backgrounds, and both audio and MIDI files. There were several instances where little details seemed to fall through the cracks in the documentation, which slowed me down, but I am impressed by the clarity of the interface. The Cue Sheet—which is somewhat like the Over-

showed the configuration of my two Mirror monitors. Once I'd decided which monitor I wanted the Stage to be on, the Stage position was protected—that is, whatever hectic actions I do with the cursor, the Stage and its contents will not be accidentally moved or deselected.

THE RETURN OF EIGHT-TRACK

With Producer you can have images in layers, with elements that can pop on and off in second-by-second cues. Each of the mod-

ules—Slide, Movie, Picture, Animation, Marker, Pause, CD Disc, MIDI, and Audio—includes an internal editor. The transition menu for each of the visual modules provides a long list of effects, such as different blinds, curtains, wipes, and irises. The Audio editor includes a SoundEdit-type of soundwave window. A Record button is included on the Transport bar. Producer will accept input from Macromedia's MacRecorder, but only the most recent version—1.02 or higher. It reads AIFF, but not AIFF/C (compressed digital audio) files.

The MIDI editor is unusually full-featured. It lets you change track volume, work with drum tracks, and change a track's stereo panning, the key of the entire sequence, and the MIDI device map. The Movie editor can select frames for editing, moving frames, and for QuickTime. The slide show editor lets you do the basic things you'd want to do with a presentation program.

The ability to expand a presentation up to eight tracks in any combination of media is very important, and not available in any other program with this synchronization. As with the columns in Microsoft Excel, you can click and drag these tracks to any width, so that you can choose to save space where you need

it and then expand other areas to reveal the full cue texts of a more complex track. In fact, Producer can be seen as a kind of multimedia spreadsheet that flows in time on time.

PRODUCER AT WORK

Angel Woodward is the Manager of Document Production of Foxton, Colorado-based Virtuality, Inc., a company that produces virtual reality and computer animation and simulations. "In our multimedia productions," said Woodward, "we will use QuickTime, MacroMind Director, and Passport Producer to create real-time and videotape presentations that will demonstrate our capabilities for our clients. I like Producer because it's very easy to use—I think they did a very good job of designing the interface. It's really easy to move things around—I just click and drag."

Joan Huntley, a beta-tester of Passport Producer, is the director of the Multimedia Computing Studio at the University of Iowa, which provides services to people from all over the campus. It is a predominantly Macintosh-based installation that also includes a Silicon Graphics Indigo and a couple of NeXTs.

In U.I.'s main academic library is a \$1.5 million facility called the Information Arcade, with an instructional classroom supported by twenty-four Quadras (eat your heart out, University of California). Huntley administers the Information Arcade for teachers, in disciplines ranging from geology to literature, who use QuickTime files for video and other media sources to assemble multimedia classroom presentations. Producer has taken over in these facilities as the program of choice. "With Producer, these people do not have to be computer science majors; in fact, half of the teachers that work in this facility

had never used a Macintosh before," says Huntley.

"We formerly used Macromedia's MediaMaker," she adds, "but I had trouble getting it to work and moving applications from machine to machine. We found that Passport Producer does everything that MediaMaker does, plus many more things. The only place that Producer comes up short in comparison is that MediaMaker has device control, which Producer doesn't yet. We still do a lot of video disk work here on campus, so device control is one thing we would like to see incorporated in Producer."

She cites Producer's ability to control eight tracks of information and its lack of restriction on the kinds of content of each track as stellar accomplishments. "I find it very powerful to be able to have eight different graphic objects, or QuickTime movies, or sound, that you can manipulate on the screen. There's nothing out there that I think will allow you to integrate CD audio and MIDI with visuals as easily as Producer. You can use it as an eight-track sound mixer, or coordinate eight tracks of QuickTime MooVs. You have a much richer set of what you can compose on the screen, and you can define areas of the screen where you can have events happening.

"Director takes a higher learning curve to get up and running," she concludes. "With Producer I can sit someone down and never have to show them the manual. I show them the screen and how it works and they are off and running at a basic level. At a basic level, it's instinctive."

PASSPORT TO THE FUTURE

According to Passport, a future version of Producer—perhaps the next one—will include some device control. That will ultimately include Kaleida Labs' ScriptX technology when it's ready. ScriptX is expected to go well beyond command-based device control like MediaMaker, and even beyond application-specific Apple events. Macromedia has also committed to ScriptX, but thus far only to its core authoring programs, Director and Authorware.

Like MacroMind Director, Producer includes a runtime player. Passport Producer Player can be duplicated and distributed free under a lifetime license as part of the package. Creating a Player document can be as simple as selecting the "Save as Player File" option in the Save dialog box. From the reports thus far, it is likely that the Passport Producer Player icon will become a familiar road sign on the busy highway of multimedia. ■

Joan Huntley, University of Iowa:

"There's nothing out there that I think will allow you to integrate CD audio and MIDI with visuals as easily as Producer. You can use it as an eight-track sound mixer, or coordinate eight tracks of QuickTime MooVs."

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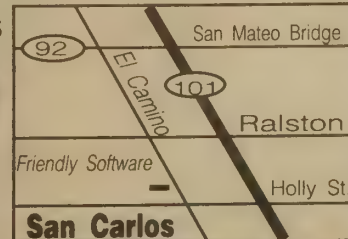
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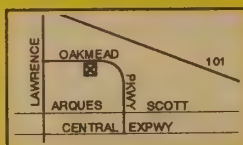
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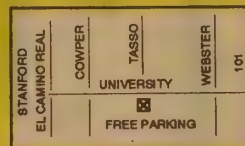
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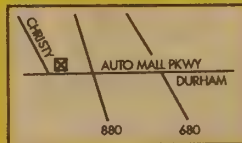
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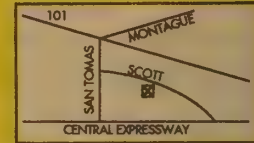
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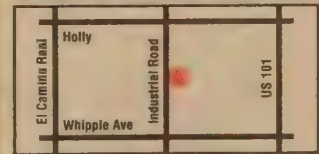


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BMUG's Crystal Ball

Predictions From The Sublime To The Ridiculous

BY DAVID
MORGENSTERN

It's that time of the year, where I open myself up, revealing all my deep, dark secrets. Well, not too deep and dark. Sorry. Instead you get my New Year's resolutions, the things I know won't be accomplished in the year to come. We also pull out the MacOuija board and get BMUG's predictions for 1993.

WRING OUT THE OLD YEAR'S RESOLUTIONS

I always have lots of resolutions at the new year, but the doing is always the hard part. The dieting, the changing of the car fluids, and buying a new couch for the living room, are all on my list. How many of them will remain in 365 days? Too many.

Here are a few of my computer New Year's resolutions:

I will not install new system software. I just installed System 7.1, which I'm sure is much better than any previous Macintosh operating system. But I'm having the usual compatibility and installation problems.

It's nothing major, just a handful of often used Extensions that need updating, and a split fingernail from repeatedly hitting the reset switch during a series of crashes. There's also the emotional toll—the constant in-the-back-of-your-mind worry of a sudden bomb.

I didn't follow the BMUG rule on installation: Always install a "clean" system; don't install over an existing system. I painted over my old system on purpose, testing the rule for science. OK, I was lazy. Wouldn't you know that I'd come up with a bunch of font-related problems. They immediately went away as soon as I removed the old system, and installed a clean one.

To install a clean system, boot up with your Disk Tools disk, and open the System folder on your startup hard drive. Remove the System and Finder files there and put them in the Trash. Now you can run the Installer on the Install disk. If you have a file or folder named Fonts in your System folder, be sure to give it a new name before the install—there may be conflicts with the new System 7.1 Fonts folder.

I will not play games when I have some real

work to accomplish. I keep trying to beat my high scores in a new color game from the BMUG library, JewelBox. It's like Tetris and utterly compulsive. Every day I play it, over and over again. But do I remove the game from my hard drive? Are you crazy?

I often push the limits of my own self-delusion with programs that have some real use. When I'm on a deadline, it suddenly becomes vitally important to trim down a long James Brown digitized sound, so that my system beep sings, "Wow!" I use Riccardo Ettore's great shareware sound application, Sound Mover, on BMUG's Sounds A1 disk.

I will not purchase productivity software that I won't use. I am a total sucker for utilities and productivity software, but end up with the programs just taking up space on my hard drive.

Last year I bought Intuit's Quicken, the household accounting program, telling the entire family that we would soon discover where we were overspending. It's easy to use and set up, but I just "couldn't find" the few days it would take to set up all the accounts. I was too busy playing games!

I will toss out old computer boxes. For some reason, we all save the boxes our computer hardware comes in. I can see saving them for a month or two while we're breaking the machines in, but a year or two? Most computer problems become evident in days, not months.

We don't have any more room for resolutions. You're certainly welcome to borrow any of mine—perhaps you will do better with them. I know you'll do better.

THE BMUG FORTUNE COOKIE

At the end of the year I wander around the BMUG office grabbing people's coat sleeves, trying to get them to hold still long enough to predict what will happen in the year ahead. Here are the results of our crystal ball gazing:

BERNARD ABOBA, AUTHOR OF THE BMUG GUIDE TO BULLETIN BOARDS AND BEYOND

1993 will be remembered as the year that saw

"I keep trying to beat my high scores in a new color game from the BMUG library, JewelBox. It's like Tetris and utterly compulsive. Every day I play it, over and over again. But do I remove the game from my hard drive? Are you crazy?"

the birth of the National Public Telecomputing Network. NPTN, which now has fifteen nodes worldwide, will be in thirty-five cities by 1994, and fifty or more by 1995, providing free access to telecommunications for millions of Americans. By that time it will



Copyright © 1993 by David Morgenstern. All rights reserved. David Morgenstern believes that computers and BMUG can cultivate a positive change in the world. He volunteers time at BMUG, when he's not working his "regular job," writing, or prowling around the BMUG Bulletin Board. He can be reached through the BMUG office, AOL: daviD eM, CIS: 72030,1607, and Internet: davidm@sfsu.wax1.sfsu.edu.

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have terminals in hundreds of public libraries nationwide, establishing a de facto national electronic mail and communications system.

I predict that this year, someone will finally produce music software that can compose—and yes, even sing—as badly as some of our most popular heavy metal bands, with one such hit song reaching the Top 10. This in turn will spawn a new software category—Artificial Teenage Intelligence.

STEVE COSTA, BMUG LEXECUTIVE DIRECTOR.

My prediction from talking to people at Apple is that they will have big problems meeting the management difficulties that will come with introducing twenty-five new products in the next eight months. Watch the stock go down, and stay down for a few months, and then shoot up...

I bet that Newton will be a mild success, rather than a blow-it-out-the-door success.

STEPHEN HOWARD, BMUG BOARD MEMBER AND MACWEEK EDITOR

1) Apple will get a shock to its belief that it's really a software company this year, as several important system software extensions are released and fail to get support from third parties.

Specifically, ColorSync will fail in the high-end color market, AppleScript will fail all around, and OCE will be very late. QuickDraw GX will be partially supported by several companies, however. Meanwhile Microsoft's Windows for Workgroups will get huge support over the course of the year, and Apple will be left to wonder why its developers aren't jumping on the Cupertino bandwagon. Apple will also be slow in releasing the international WorldScript extensions in the US, because the company doesn't really want to support the technology here, and third-parties will not make their mainstream applications world-ready.

2) Intel will release the Pentium at premium prices, so only premium PC companies will be able to offer systems built around it. Third-tier clone makers who try and build Pentium computers will go out of business. But the deals on the 486-based PCs will continue all year.

3) GO Corp. will release PenPoint 2.0, which will focus on wireless and intermittent communications. It'll be very cool and a natural for handheld communications devices, but the bloom is off the pen-computing rose and people will openly question whether GO has a market. There will be talk of AT&T buying

GO, but I doubt it'll happen.

4) Congress will pass veep-elect Al Gore's "son of NREN" bill, and suddenly K-12 education will have Internet connections for the asking, but neither the expertise or the equipment to use them. Some smart VARs (and maybe a smart nonprofit group) will try to fill the gap by hooking up schools to the Internet, but these efforts won't make a big impact.

5) Judge Harold Greene, who presided over the breakup of AT&T, will be considered for, not the first, but the second vacant Supreme Court seat.

6) *Steve Jackson v. The United States* will be decided in favor of the role-playing game developer, and the case will set a precedent for applying stricter standards in getting warrants for computer crime investigation.

7) Aldus Corp. will continue to be up for sale, and there still won't be any buyers.

8) Somebody in Apple is going to realize that Claris is a lousy investment, and the company will do something about it. My best guess is that the company will go through a flurry of acquisitions and move strongly into the mail-order channel. The dealers will get really pissed off, and Apple will disclaim responsibility.

9) Someone in Europe will write a really cool hack to the Mac OS that Apple will not like at all. The software will be pirated by everyone everywhere, and the author won't make any money.

DANA KEIL, BMUG MEMBER AND UNIVERSITY OF CALIFORNIA COMPUTER RESOURCE SPECIALIST

I think all the stuff that I'm going to find exciting this year will happen with wireless communication. This will be cellular, and also the new short distance wireless telephony. Electronic mail will take off with Apple's OCE, which promises to give a system-level way of dealing with electronic mail, compared to today's situation using gateways and such to transfer email from one system to another.

The coming affordable telephone technology and cellular modems will let us have access to all the resources available to the present telephone network, without having to find a phone jack to plug into—as is currently necessary, if you want your PowerBook to pick up electronic messages from your office while on the go. I expect at the end of this year to sit at my favorite cafe having a Caffé Latté, while reading memos from the office and keeping up to date with the crisis of the day. But then again, maybe fax is enough for the unwashed masses, and none of this will really get off the ground.

What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its thirteen thousand international members. BMUG supports many Special Interest Groups (SIGs), a Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose.

The BMUG Office, 2055 Center St. (a half block from the BART station) is open to the public from 9 am to 5 pm. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (510)540-1742, and our fax number, (510)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am–5 pm). If your question can't be answered on the spot, we try to get you in touch with someone who can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around with hundreds of disks filled with the latest versions of public domain or shareware programs, and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the TV-ROM™, a fantastic collection of public domain QuickTime videos.

Our new graphic user interface FirstClass 16-line BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. With our multiline capability, you can have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most electronic services. BMUG can also be reached through the Internet international network through bmug@aol.com.

To get some further information about BMUG please write to: BMUG, 1442A Walnut St., #62, Berkeley, CA 94709. If you prefer to phone our business office call (510)549-BMUG, or fax (510)849-9026.

DAVID MORGENSTERN, BMUG CHEERLEADER.

Toy manufacturers will break out of the game machine market, and offer serial and ADB port adaptors for their "smart toy" controllers. We will be able to easily hook up PowerGloves, cheap Virtual Reality helmets, and joysticks to our Macintoshes. There will be problems, however. Several terrible drunk-driving automobile accidents, involving teen-

Continued on page 270

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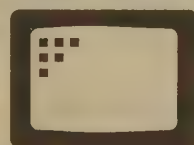
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Amiga Animation At Disney

Affordable Technology Offers Advantages Over Traditional Approach

BY
DOUGLAS J.
NAKAKIHARA

Disney has always been known for top-quality animation. Nearly everyone today has been touched in one way or another by a Disney creation, and we are all familiar with the cast of classic Disney characters. To some of us, they are almost friends.

It seems only fitting that the Amiga, a powerful animation tool, would find a niche at Disney, specifically at the Television Animation arm of Walt Disney Pictures and Television.

In an environment where artists have for decades painstakingly created animation

using the Netware product from OXXI, Inc. Additionally, the two Amigas are networked directly together via the SCSI controllers using the SCSI-SHARE product from IVS. This allows direct file sharing between the two computers. Talk about connectivity!

TRADITIONAL ANIMATION

To really appreciate the benefits the Amiga provides, it is important to understand how animations are created using the traditional process. Before an animation can be made, a storyboard must be created. A storyboard is a series of black-and-white hand-drawn pic-

various perspectives. This gives the actual animators a three-dimensional idea of what the car looks like. One other designer, called the color designer, creates colored models of the characters, props, and backgrounds.

Interestingly, the Disney designers don't draw the final animation, they only provide the "look" of the cartoon. The work the public actually sees is not technically the work of Disney designers. Because a twenty-minute cartoon requires nearly twenty-nine thousand frames to be drawn and painted, this work is usually farmed out to animation studios located in other countries where labor is cheaper. Normally, an army of animators is used to make the final product. These studios are sometimes independent and not related to Disney.

In creating the animation, the animators base it on the key frames in the storyboard. They are only given specific information as to what certain frames should look like, and from that must also create the frames between the key frames. This is sometimes called "tweening." The designers' models provided with the storyboard are used as reference information to help these animators tween.

ANIMATION WITH THE AMIGA

So how does the Amiga fit into all of this?

Day uses a 3-D rendering program to create characters, backgrounds, or props. Once all of the objects are created and properly oriented, he can position the camera and print the model on a laser printer. He can literally print the scene from any perspective by simply changing the camera view! For one project, he had to create Goofy's living room. Once the room was created in the 3-D program, he printed multi-perspective background pictures of the room without ever having to draw it. This saves tremendous amounts of time. The traditional method would require each model to be drawn by hand.

Though Day has used various 3-D rendering programs in the past, he now relies on Playmotion from Hash Enterprises.

For one project, Amiga-using designer Kelly Day had to create Goofy's living room. Once the room was created in the 3-D program, he printed multi-perspective background pictures of the room without ever having to draw it. This saves tremendous amounts of time.

masterpieces by hand, the Amiga is revolutionizing the process. The man behind this revolution, Kelly Day, has managed to convince the powers that be that the Amiga is a practical tool for what has traditionally been—and still is, for the most part—a totally manual process.

Day has been with Disney for about four years. Although his name may not be familiar to you, his work might—his credits include such movies as *The Rescuers* and *Duck Tales*, as well as the made-for-TV cartoons *Talespin*, *Dark Wing Duck*, and *Goof Troop*. He is currently working on a new animated cartoon series called *Bonkers*.

Day's computer setup consists of an Amiga 3000 with a 1950 multiscan monitor and an Amiga 2500 with a 1084 monitor. Both computers are equipped with Syquest removable media disk drives, IVS's Trumpcard SCSI controller cards, and Ethernet cards. The Amigas are connected to a Novell local area network

tures, called "panels," depicting important moments (also known as key frames) in the animation. The full dialog and other direction notes are written under each panel.

Animations are created assembly-line style; basically three types of people are involved—character, prop, and background designers. The character designers are in charge of "living" objects, and the prop designers cover nonliving objects that move. The background designers draw the static elements in a scene.

For example, if the animation involved a man picking up a stick in a room, the background designer would draw the room, the character designer would draw the man, and the prop designer would draw the stick.

The Disney designers study the storyboard and then draw black-and-white line art pictures called "models." For instance, if one of the main features of the animation was a car character, a designer would draw the car from

Playmation's spline-based objects are ideal for the output needed. All scenes are rendered to high-resolution IFF files.

If you watch cartoons, you'll notice that objects are usually a single color outlined in black. As a result, in contrast to the normal 3-D rendering objective of photo-realism, objects cannot have any shading—they must be a flat, single color. To achieve this, all of the objects are set to reflect 100% of the ambient light. Color selection is also very important, as objects that overlap or are connected must be different colors. Each side of a cube, for example, would have to be a different solid color.

The rendered picture is then run through a program called Trace, a utility included with Gold Disk's Professional Draw, a structured drawing program. Structured drawing programs are used to create high-quality output, usually using a PostScript output device. With PostScript, output quality of structured drawings is determined solely by the capabilities of the output device, and is significantly superior to that of bit-mapped graphics, whose resolution is normally tied to the display resolution and usually contains a lot of jaggies when printed.

Trace turns the picture into a ProDraw clip that's an outline of the original picture. Trace only draws lines where a color changes from one to another, which is one of the reasons it's important not to have any shading. So if you had a red teapot with a blue handle, Trace would separately outline the teapot and handle. If the handle and teapot were the same color, both objects would be outlined, but there would be no separation between the pot and handle.

Once Trace is finished, the clip is loaded into ProDraw for printing on a PostScript printer. This may all seem rather complicated, but since ProDraw finally supports ARexx, Day has written an ARexx script to handle nearly everything. Once all of the frames are rendered, he can trace and print each frame automatically with no human intervention. The final printed product is virtually indistinguishable from its hand-drawn counterpart.

Day is also very proud of being one of the only designers who sometimes includes fully animated frames for tricky sequences. As discussed above, this work is normally done by the animation studio, but any help that he can provide will obviously make for a better final product. Since the scene is already defined in three dimensions, all he has to worry about is the path of the camera and the timing. Playmation has a unique and powerful way of accomplishing this using a time-line metaphor.

Because a twenty-minute cartoon requires nearly 29,000 frames to be drawn and painted, this work is usually farmed out to animation studios located in other countries where labor is cheaper.

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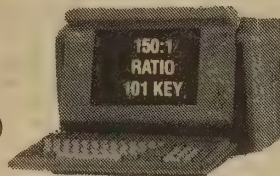
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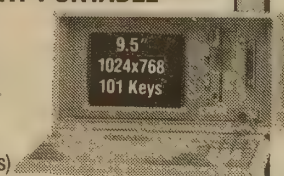


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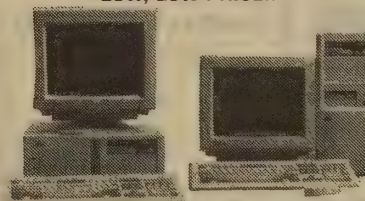
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Normally, computer-generated animations are not directly used in cartoon animations.



Model of Goofy's Living Room—"Goof Troop"

When previewing an animation on screen without background, he often draws various references directly on the display screen using a wipe-off marker. This, he says, is much faster than trying to genlock the animation over a background. In other words, it's a quick-and-dirty way to get the job done.

Normally, computer-generated animations are not directly used in cartoon animations. However, a cartoon episode Day worked on showed the characters playing a video game. In this case, the lower, resolution computer output was required. As a result, an actual Amiga-generated animation was mixed into the cartoon.

"ANIMATIC STORYBOARDS"

Day also uses the Amiga to create "animatic storyboards." Normally there are three acts to a twenty-minute cartoon, and the traditional storyboard for each act is several inches thick. Although great effort is made to include as much information as possible in the storyboards, much interpretation is left up to the animation studio as to what the final cartoon should look like. Since each panel in the storyboard represents various amounts of time, it is nonlinear, and the "feel" of the cartoon is absent. The animators are missing the timing of the events, and this can affect the cartoon's humor.

An animatic storyboard is a video of the storyboard synced with the cartoon's soundtrack. This gives the animation studio much more information about what is desired and how events should be timed. The result is related to a slide show with sound commentary at appropriate intervals.

To digitize the soundtrack, Day uses Sunrize Industries' AD1012 12-bit sound board and Studio 16 software. The storyboard pictures are brought into the Amiga using Progressive Peripheral's Framegrabber. Once the sound and pictures have been digitized, the two elements must be synced together.

Gold Disk's Showmaker is used to control when pictures are displayed. However, because he was working with so many frames, Day found that Showmaker's input method was very tedious and time consuming, so he wrote his own customized input program that saves data files in Showmaker format. The program not only shows the SMPTE time

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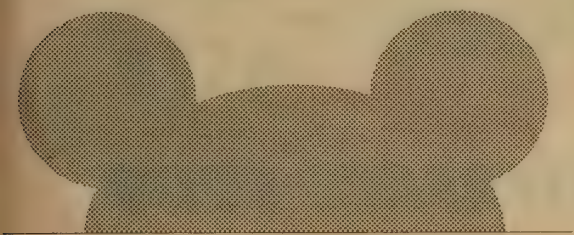
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code, but also the film length in feet, a reference methodology used by many animators.

By multitasking Studio 16 with his own program, Day can view the graphical representation of the soundtrack's soundwave and sync up the frames accordingly. If he needs to know what is happening at a particular point in the soundtrack, he can use the mouse to highlight the portion of the soundwave he wants to hear and play it.

When the storyboard is ready to be recorded, the Amiga 2500 runs Showmaker to display the frames, and Studio 16 on the Amiga 3000 plays the animation soundtrack. The two computers are kept in sync using an independent SMPTE timecode source. The SMPTE signal is fed simultaneously into both Amigas. The AD1012 in the Amiga 3000 has a built-in SMPTE connector; however, on the Amiga 2500, the timing signal must be fed into a MIDI interface, so an exter-



The work the public actually sees is not technically the work of Disney designers. Normally, an army of animators is used to make the final product.

nal SMPTE-to-MIDI converter box is used. The show is recorded onto videotape in real time.

It is important to note that although Day is using two Amigas, Showmaker and Studio 16 could be multitasked on the the same computer, accomplishing the job using a single Amiga! Moreover, except for the lower sound quality, the Amiga's internal 8-bit sound could also be used in lieu of the 12-bit sound board.

Though the animatic storyboard is not animated per se, it does provide timing and give the sense of movement that the traditional storyboard lacks. This makes the communication between the Disney designers and the animation studio more effective and helps prevent costly mistakes. As most computer users will attest, it is infinitely easier to have someone show you how to do it, rather than having to read the manual.

What's really impressive is that all of Day's hardware and software is off-the-shelf product. When animation companies start realizing the profit potential of Amigas, look out—the flood gates will be opened.■

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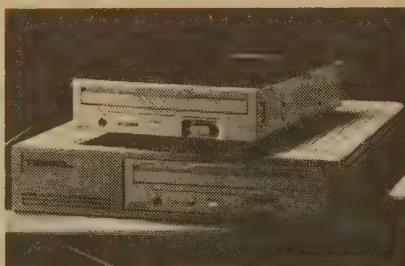
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PRODUCT SPOTLIGHT

Continued from page 212

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Published By: The Software Toolworks

List Price: \$59.95

Reviewed By: Woody Liswood

If you like to play chess, you will like Chessmaster 3000 CD-ROM. It offers a good game of chess with graphics, has stored games for you to explore, and generally, is fun to use.

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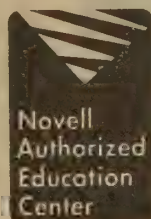
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move. A Personal Guide actually talks you through a game, and Help talks to you. As you play, the extensive help system can give you illustrated advice on legal moves and highlight pieces that might be threatened.

The documentation is one of the best things about this program. It contains a booklet with pictures of many of the major players and matches throughout recorded chess history, a history of chess, and even a brief description about how to play chess. The documentation also says that Chessmaster 3000 has over 150,000 starting positions stored for your use.

I can't really tell you how good a chess player Chessmaster 3000 is. It played well. Sometimes it beat me, sometimes I won. But I did not try it at any advanced level. If you want to be rated, Chessmaster provides you with a rating. And, if you like a specific type of chess notation, Chessmaster offers coordinate, algebraic, English, International, or long algebraic notations.

If you like a chess opponent who plays music and talks to you about your move, gives you verbal advice, if warranted, and has a variety of graphic chess pieces and boards, then you will really like Chessmaster 3000.

Although Chessmaster is available in a multi-disk MS-DOS version, I prefer the convenience and added goodies of CD-ROMs. This CD-ROM based multimedia software is where the entire industry is heading. I like it! (The Software Toolworks, Inc., 60 Leveroni Court, Novato, CA 94949. 415/883-3000) ■

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6. Not responsible for typographic errors
7. All returns are subject to 15% restocking fees and cover only computers excludes peripherals. Norefunds after 30 days
8. Government & Corporate Purchase orders are welcome

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Having been in the PC business for over 8 years, we at WIT know just what it takes to GUARANTEE our customers SUPER DEALS. By guaranteeing you the HIGHEST QUALITY & RELIABILITY in our systems with proven service, we feel assured that our customers are getting the BEST DEAL. So call WIT today and find out how you can also get the BEST DEAL.



**NEW
ARRIVAL**
LOCAL BUS MOTHERBOARD
VESA STANDARD
32 BIT SUPER VGA
32 BIT IDE I/O

EISA 486-50 MHz \$1790

EISA 486-33 MHz \$1590

- * 4 MB RAM w/256K Cache
- * 120 MB IDE Hard Drive
- * 1.2 & 1.4 MB Floppy Drive
- * IDE 2FD/2HD Controller
- * 2 Serial, 1 Parallel, 1 Game Port
- * 101K Enhanced Keyboard
- * Mini-Tower Case + Power Supply
- * 14" SVGA Monitor .39 + VGA Card
- * Clock/Calendar with Battery Back-up
- * Built-In Math Co-Processor Socket
- * 72 Hours Burn-In
- * CPU FAN Lowers Temp. 50%

OPTIONS:

- 200 MB Hard Drive.....Add \$100
- 340 MB Hard Drive.....Add \$450
- SVGA .28 w/1 MB Card.....Add \$60
- SVGA NI .28 w/1 MB Card.....Add \$100

ISA 486-50/486-33..... \$1490/1290

ISA 486DXII-66/DXII-33.. \$1540/1340

- * 4 MB RAM w/256K Cache
- * 120 MB IDE Hard Drive
- * 1.2 & 1.4 MB Floppy Drive
- * IDE 2FD/2HD Controller
- * 2 Serial, 1 Parallel, 1 Game Port
- * 101K Enhanced Keyboard
- * Mini-Tower Case + Power Supply
- * 14" SVGA Monitor .39 + VGA Card
- * Clock/Calendar with Battery Back-up
- * Built-In Math Co-Processor
- * 72 Hours Burn-In
- * CPU FAN Lowers Temp. 50%

OPTIONS:

- Local Bus w/32 Bit-S3 SVGA...Add \$230
- Diamond SpeedStar 24X.....Add \$100
- Diamond Stealth.....Add \$175
- Orchid Fahrenheit.....Add \$165

486SX-33 MHz..... \$1070

486SX-25 MHz..... \$1020

- * 4 MB RAM w/256K Cache
- * 120 MB IDE Hard Drive
- * 1.2 & 1.4 MB Floppy Drive
- * IDE 2FD/2HD Controller
- * 2 Serial, 1 Parallel, 1 Game Port
- * 101K Enhanced Keyboard
- * Mini-Tower Case + Power Supply
- * 14" SVGA Monitor .39 + VGA Card
- * Clock/Calendar with Battery Back-up
- * 72 Hours Burn-In

OPTIONS:

- 256K Cache.....Add \$25
- RAM/per MB.....Add \$35
- Upgrade Mid-Tower.....Add \$25
- Upgrade Full-Tower.....Add \$45

NOTEBOOK

- 386-25SL- VGA-Mono \$1500
- VGA-Color.....\$2300
- 486-25 SLC VGA-Mono \$1550
- VGA-Color.....\$2500

Upgrade:

- 80 MB Hard Drive.....Add \$70
- 120 MB Hard Drive.....\$190
- Fax/Modem.....\$170
- Memory per MB.....\$50

NOTEBOOK SYSTEMS INCLUDE:

- * 386-SL25 Processor w/64K Cache or 486/SCL Processor
- * 2 MB RAM
- * 60 MB Hard Drive
- * Internal 1.44 MB 3.5" Drive
- * Color VGA Liquid Crystal Display (LCD) 640x480 Resolution, 9" Diag. Or Paper White VGA 10" Liquid Crystal Display 640x480 Resolution, 64 Shades Of Gray on Monochrome LeaderBook
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- * Connector for Docking Station
- * 1 Parallel/1 Serial Ports
- * Dual NiCAD Batteries and Power Adapter
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- * External Port for Keyboard
- * Built-In 2-Button Trackball
- * MS-DOS 5.0
- * 8.5"x14"x1.73". Only 5.7 lbs
- * Carrying Case

386-40 MHz \$990

386-33 MHz \$975

- * 4 MB RAM w/128K Cache
- * 120 MB IDE Hard Drive
- * 1.2 & 1.4 MB Floppy Drive
- * IDE 2FD/2HD Controller
- * 2 Serial, 1 Parallel, 1 Game Port
- * 101K Enhanced Keyboard
- * Mini-Tower Case + Power Supply
- * 14" SVGA Monitor .39 + VGA Card
- * Clock/Calendar with Battery Back-up
- * Built-In Math Co-Processor Socket
- * 72 Hours Burn-In

OPTIONS:

- 100 MB Hard Drive.....Less \$30
- 80 MB Hard Drive.....Less \$60
- 40 MB Hard Drive.....Less \$110

386SX-33 MHz..... \$780

386SX-25 MHz..... \$760

- * 2 MB RAM
- * 40 MB IDE Hard Drive
- * 1.2 & 1.4 MB Floppy Drive
- * IDE 2FD/2HD Controller
- * 2 Serial, 1 Parallel, 1 Game Port
- * 101K Enhanced Keyboard
- * Mini-Tower Case + Power Supply
- * 14" SVGA Monitor .39 + VGA Card
- * Clock/Calendar with Battery Back-up
- * Built-In Math Co-Processor Socket
- * 72 Hours Burn-In

OPTIONS:

- 2nd Floppy Drive.....Add \$55
- 14" Amber Monitor + MGP...Less \$140

COMMITMENT TO SERVE YOU:

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ALL AROUND SATISFACTION:

Stanford University, UC Berkeley,
United Postal Service, AT&T,
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Conner, Quantum

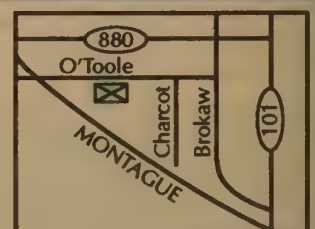
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AND SO WILL YOU!



486/33-50 EISA VESA Local Bus Ultimate CAD/CAM

- Intel 80486DX-33 or 80486DX-50 CPU
- 8 Layer USA EISA Motherboard
 - 2 x 32 Bit VESA Local Bus Slots
 - 8 x 32 Bit EISA Expansion Slots
- 256K Cache (Up to 1MB on Board)
- 8MB 60ns RAM (Up to 256MB on Board)
- 200 MB SCSI Hard Drive
- 32 Bit EISA SCSI Hard Drive Controller
- 2 Floppy Disk Drives - 1.2MB & 1.44MB (Teac)
- Viewsonic 7 - 17" Color Monitor (.28dp 1280x1024)
- Northgate Omni101 Keyboard
- Full Tower Chassis w/250 Watt U.L. Power Supply
- I/O: 2S/1P/1G

\$3899/\$4199

Polaris 486-33PV/455PV with Panoramic View

- Intel 80486DX-33 or 80486DX-50 CPU
- Made in USA Motherboard
- 256K Write-Back Cache (20ns)
- 4MB 60ns RAM (9 Chip)
- Artist Graphics Winsprint Panoramic View Graphic Accelerator (1MB VRAM, 32,768 Colors, 2048x768)
- 130 MB Maxtor Hard Drive
- 2 Floppy Disk Drives - 1.2MB & 1.44MB (Teac)
- 14" Non-Interlaced SVGA Monitor (.28dp)
- Maxiswitch or Monterey 101 Key Enhanced Keyboard
- Full Tower Chassis w/250 Watt U.L. Power Supply
- I/O: 2S/1P/G

\$2149/\$2399

Polaris 433VL/455VL VESA Local Bus

- 6 Layer Made in USA Motherboard w/32 Bit VESA Local Bus
- Intel 80486DX-33 or 50 CPU w/Math Co-Processor
- 64K Cache Standard (256K Add \$75)
- 4MB 60ns RAM (9 Chip)
- 32 Bit VESA Local Bus Graphic Accelerator (Choose from ATI, Diamond or Orchid)
- 130MB Maxtor Hard Drive
- 32 Bit VESA Local Bus Hard Drive Controller
- 2 Floppy Disk Drives - 1.2MB & 1.44MB (Teac)
- 14" Non-Interlaced SVGA Color Monitor (.28DP/1024x768)
- Maxiswitch or Monterey 101 Key Enhanced Keyboard
- Medium Tower Chassis w/U.L. Approved Power Supply
- I/O: 2S/1P/G

\$1949/2149

Polaris 486-33/50 ISA

- 6 Layer Made in USA Motherboard
- Intel 80486DX-33 or 50 CPU w/Math Co-Processor
- 64K Cache Standard (256K Add \$75)
- 4MB 60ns RAM (9 Chip)
- 130MB Maxtor Hard Drive
- 2 Floppy Disk Drives - 1.2MB & 1.44MB (Teac)
- 1MB Trident SVGA Card (1024x768 - 256 Colors)
- 14" Non-Interlaced Color Monitor (.28dp 1024x768)
- Maxiswitch or Monterey 101 Key Enhanced Keyboard
- Medium Tower Chassis w/U.L. Power Supply
- I/O: 2S/1P/G

\$1649/\$1899

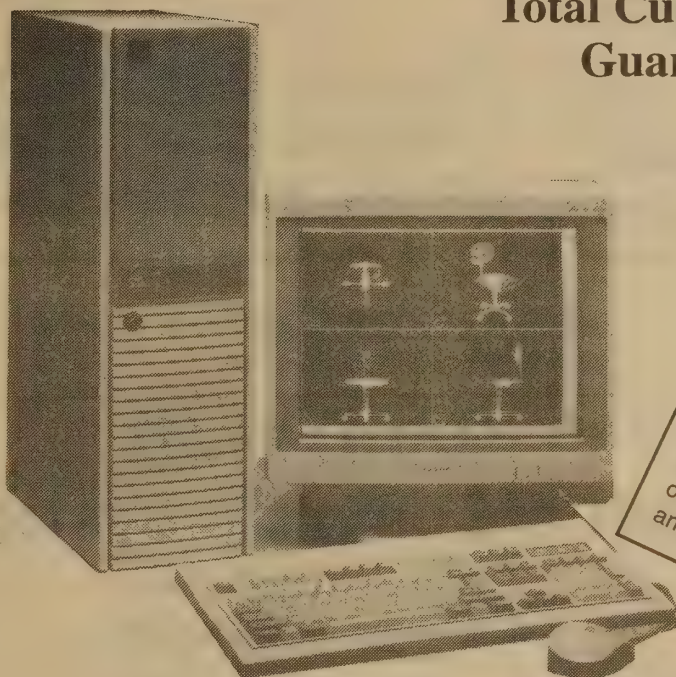
COMPUTER MONTHLY JAN. '93

"It doesn't mimic the components of competing products." That's what Computer Monthly said when they reviewed the Polaris 455PV. And because it's no copycat, it has "the fastest video of any system reviewed in the past year." In addition, the hard drive "was so fast that several tests could not be measured." Computer Monthly said "this is a first class product in all respects." You'll say "WOW!" They had more to say, like, "Polaris Microsystems has done an outstanding job... so outstanding, in fact, our benchmarks went through the roof."

"If what you need is the ultimate in speed in your computer, you need to take a look at the Polaris Microsystems line of machines. As the test below will show, these machines are among the fastest available..."

Computer Currents, Aug. 11, 1992

**5 Year Labor Warranty
2 Year Parts Warranty
Total Customer Satisfaction.
Guaranteed!**



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Come see the next generation of VESA Local Bus products demonstrated by experts. We have all the new Local Bus products from ATI, Diamond, Orchid and many other U.S. manufacturers. At Polaris we give you straight answers about the advantages of the VESA Local Bus standard, and the future of this technology.

The Polaris Quality, Performance, and Service Guarantee

- 5 Year Labor Warranty
- 30 Day Money Back Guarantee
- Top Quality Components with Made in USA Motherboards
- Minimum 72 Hour Burn-In
- Detailed Diagnostic Print-Out
- 2 Years Parts Warranty
- Free Software Installation
- Lifetime Technical Support
- Net Terms Available To Qualified Dealers
- Complete System & Custom Configuration

Hard Drives

Maxtor 7120A IDE	\$275	Conner 170MB IDE	330
Maxtor 7120S SCSI	325	Conner 200MB IDE	425
Maxtor 7213A IDE	395	Fujitsu 512MB IDE	995
Maxtor 7213S SCSI	495	Fujitsu 512MB SCSI	1,025
Maxtor LXT340A IDE	715	Tape Backups	
Maxtor LXT340S SCSI	725	120MB Tape Backup	220
Conner 120MB IDE	285	250MB Tape Backup	250

Complete Upgrade Options Available

Prices subject to change without notice.



Polaris MicroSystems

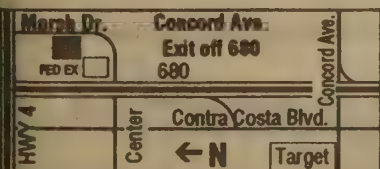
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Hawk 486-EISA 50MHz 256K Cache

- ☐ Intel 80486DX-50MHz CPU chip, AMI BIOS
- ☐ 256K fast SRAM Cache on board (20NS)
- ☐ 4MB RAM (60NS), Maximum 128MB
- ☐ One 32bit local bus, Three 32bit EISA, Four ISA slot
- ☐ 275 Watt power supply with two cooling fan
- ☐ Full tower case with 7 drives bay
- ☐ Teac One 5 1/4" 1.2MB floppy drive
- ☐ Teac One 3 1/2" 1.44MB floppy drive
- ☐ Two serial, One parallel & Game port
- ☐ Focus 2001 enhanced 101-key keyboard
- ☐ MicroSoft DOS 5.0 & Windows 3.1, Hi-res mouse
- ☐ Landmark 167.26MHz (V2.0)
- ☐ Power meter 22.399 mips (V1.5)
- ☐ Norton SI 77.7 (4.01)

\$1299

SVGA & 120MB	\$1949
SVGA & 200MB	\$2049
SVGA & 340MB	\$2299

486DX/2-66 Complete System

With Hard Disk Drive
& Super VGA Monitor

- ☐ Intel 80486DX/2-66MHz CPU, w/64K Cache
- ☐ 4MB RAM, AMI BIOS
- ☐ IDE Hard Drive
- ☐ 14" Super VGA monitor 0.28
- ☐ Teac 1.2MB or 1.44MB floppy drive
- ☐ Two serial, one parallel, game port
- ☐ Focus 2001 enhanced keyboard
- ☐ MS DOS 5.0 w/ Menu
- ☐ 5 Year labor, One year parts warranty

\$1149

SVGA & 120MB	\$1799
SVGA & 200MB	\$1899
SVGA & 340MB	\$2149

486DX-50 Complete System

With Hard Disk Drive
& Super VGA Monitor

- ☐ Intel 80486DX-50MHz CPU, w/64K Cache
- ☐ 4MB RAM, AMI BIOS
- ☐ IDE Hard Drive
- ☐ 14" Super VGA monitor 0.28
- ☐ Teac 1.2MB or 1.44MB floppy drive
- ☐ Two serial, one parallel, game port
- ☐ Focus 2001 enhanced keyboard
- ☐ MS DOS 5.0 w/ Menu
- ☐ 5 Year labor, One year parts warranty

\$999

SVGA & 120MB	\$1649
SVGA & 200MB	\$1749
SVGA & 340MB	\$1949

486DX-33 Complete System

With Hard Disk Drive
& Super VGA Monitor

- ☐ Intel 80486DX-33MHz CPU, w/64K Cache
- ☐ 4MB RAM, AMI BIOS
- ☐ IDE Hard Drive
- ☐ 14" Super VGA monitor 0.28
- ☐ Teac 1.2MB or 1.44MB floppy drive
- ☐ Two serial, one parallel, game port
- ☐ Focus 2001 enhanced keyboard
- ☐ MS DOS 5.0 w/ Menu
- ☐ 5 Year labor, One year parts warranty

\$799

SVGA & 80MB	\$1369
SVGA & 120MB	\$1449
SVGA & 200MB	\$1549

386DX-40 Complete System

With Hard Disk Drive
& Super VGA Monitor

- ☐ Intel 80386DX-40MHz CPU, w/64K Cache
- ☐ 4MB RAM, AMI BIOS
- ☐ IDE Hard Drive
- ☐ 14" Super VGA monitor 0.28
- ☐ Teac 1.2MB or 1.44MB floppy drive
- ☐ Two serial, one parallel, game port
- ☐ Focus 2001 enhanced keyboard
- ☐ MS DOS 5.0 w/ Menu
- ☐ 5 Year labor, One year parts warranty

\$549

SVGA & 80MB	\$1119
SVGA & 120MB	\$1199
SVGA & 200MB	\$1299

386SX-25 Complete System

With Hard Disk Drive
& Super VGA Monitor

- ☐ Intel 80386SX-25MHz CPU
- ☐ 4MB RAM, AMI BIOS
- ☐ IDE Hard Drive
- ☐ 14" Super VGA monitor 0.28
- ☐ Teac 1.2MB or 1.44MB floppy drive
- ☐ Two serial, one parallel, game port
- ☐ Focus 2001 enhanced keyboard
- ☐ MS DOS 5.0 w/ Menu
- ☐ 5 Year labor, One year parts warranty

\$459

SVGA & 80MB	\$1029
SVGA & 120MB	\$1109
SVGA & 200MB	\$1209



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Life-time Technical support!

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VIDEO CARD

enhait	1MB Hi-Color 1280x1024, Accelerator S3 chip	\$219
Designer IIS	1MB 1024x768 32,768 color	139
NOA	7900 16million color 1024 x 768, 1MB	179
EO7	WIN.VGA1024 x 768 256 color 1MB 76Hz	159
mond		
th VRAM	1MB VRAM, 1280x1024, Accelerator S3 chip	219
edStar	1MB, 1024x768, Non-interlaced	129
	Ultra graphics w/Mouse	369
dent	SuperVGA 1024x768 1MB RAM	59

MONITORS

wSonic		
14"	1024x768 .28 Non-interlaced SVGA	359
17"	1280x1024 Non-interlaced	1099
20"	1280x1024 .31	1699



**Packard Bell 8528SVEL
SuperVGA**

\$269

14", .28 dot pitch
1024x768 resolution
Limited Stock

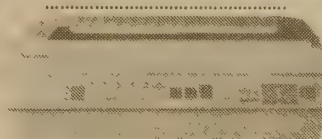
X/ 4FG/ 5FG	649/749/1399
21" 1280x1024 .28mm 135MHz bandwidth	2999
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IS 14" 1024x768 .25 Non-interlaced Low radiation	559
IS 17" 1024x768 .25 30-57 KHz scan frequency	1045
CKARD BELL 8528 SVGA 14" 1024x768 .28	269

DRIVES

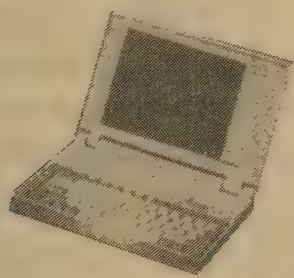
Brand	model	capacity	speed	warranty	price
IDE Hard disk drive					
Conner	CP3000	42 MB	28 ms	1 year	169
Conner	CP30084	80 MB	19 ms	1 year	219
Conner	CP30104	120 MB	19 ms	1 year	269
Conner	CP3204	212 MB	19 ms	1 year	369
Conner	CP3544	540 MB	13 ms	1 year	929
Maxtor	7080	80 MB	19ms	1 year	209
Maxtor	7120A	125 MB	15 ms	1 year	269
Maxtor	7213A	213 MB	15 ms	1 year	369
Maxtor	LXT-340A	340 MB	15 ms	1 year	649
Fujitsu	M2622T	330 MB	12ms	5 year	799
Fujitsu	M2623T	420 MB	12 ms	5 year	899
Fujitsu	M2624T	520 MB	12 ms	5 year	949
SCSI hard drive					
Maxtor	LXT-213SY	213 MB	14.5 ms	1 year	439
Maxtor	LXT-7080SR	80 MB	17 ms	1 year	279
Maxtor	LXT-340SYS	360 MB	15 ms	1 year	649
Maxtor	XT-8760S	850 MB	14 ms	1 year	1099
Maxtor	PO-12S	1.2 GB	13 ms	1 year	1399
Fujitsu	M2623S	425 MB	12 ms	5 year	Call
Fujitsu	M2263SA	687 MB	12 ms	5 year	1169
Fujitsu	1.2GB	1.2GB	14 ms	5 year	1699
Controller (IDE & SCSI)					
ADAPTEC	1542BK	SCSI hard/floppy controller			269
UltraStor	15C	IDE 0k(8MB Max.)			199
UltraStor	24F	SCSI (EISA) 64k buffer, fast SCSI-2	33MB/sec		419
UltraStor	14F	SCSI (AT), 64k buffer, Fast SCSI-2	10MB/sec		229
Future Domain	TMC-1680	SCSI-2 (AT), drive 4 floppy			169
DTC	2280	IDE (EISA), drive 3 floppy, 7.1MB/sec			149
DTC	3290	SCSI (EISA), 33MB/sec			459

PRINTERS

Panasonic					
KX-P1123	24 pin	214 cps	80 col		199
KX-P1124i	24 pin	240 cps	80 col		289
KX-P2123	24 pin	240 cps	80 col quiet		239
KX-P2124	24 pin	320cps	80 col quiet		349
KX-P2180	9 pin	192 cps	80 col quiet		159
KX-P1624	24 pin	240cps	132 col		349
KX-P2624	24 pin	300 cps	136col		379
KX-P4410	Laser	5 ppm	512K		629
KX-P4430	Laser	5 ppm	1MB PCL Scalable...		949
KX-P4455	Laser PS	11 ppm	2 MB 39 ps fonts		1695
HewlettPackard					
DeskJet	500 / 550C				399/795
LaserJet	HP plus / HP				789/999
LaserJet	4 / IIID				1399/2295
LaserJet	IIISi				3495
EPSON					
LQ-570	24 pin	315 cps	80col		269
LQ-870	24 pin	330 cps	136 co		459
LQ-1070	24 pin	315 cps	136col		389
Action	24 pin	200 cps	80col		209
LQ-2550	24 pin	400 cps	136col		899
FX-850	9 pin	264 cps	80col		309
FX-1050	9 pin	264 cps	132col		419
EPL-7000	Laser	6 PPM	512k		819
EPL-7500	Laser PS	6 PPM	2MB		1979
EPL-8000	Laser	10PPM	13 Scalable fonts		1349



New TOSHIBA Satellite T1800 Notebook



\$1649

- 80386SX 20MHz
- 2MB RAM
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- Fits in a briefcase
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- 1.44MB floppy drive
- Serial/Parallel port
- External keyboard, VGA monitor adaptor
- Automatic shut down
- Automatic "sleep" mode

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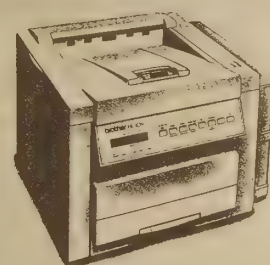
\$1299

Lower paper tray

\$289

Memory board w/1mb

\$149



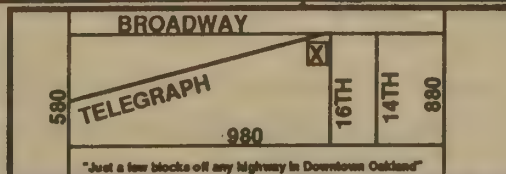
	Brother	HP LaserJet III
Page Per minute	10	8
Scalable fonts	12	8
Bitmapped fonts	24	14
Universal Tray	Yes	No
Gray Scales	64	8
Auto-Interface	Standard	No
Aotu-Emulation	Standard	No

Year in-store Labor warranty! 1 Year warranty on parts! 48 Hour repair turn-around!
Life-time Technical support! 30-day refund policy! Corporate & Gov't POs welcome!

ore Hours:

F: 9AM to 6PM

t.: 10AM to 2PM



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RESOURCES

Calendar Of Events

CALENDAR LISTING CHANGES

Beginning with issue #100, the Calendar listings were reorganized into two sections. The first part includes conferences, shows, and other special events. The second presents classes, seminars, and workshops.

We hope this will help you more easily find the information you are searching for as well as stay informed of the latest events and resources that are available to you.

Thank you,
MicroTimes staff

CONFERENCES, SHOWS, AND OTHER SPECIAL EVENTS

JANUARY

January 10 Computer Show & Sale. Alameda County Fairgrounds. Richard James. Call: 1-800-685-1400.

January 11-12 Microsoft Windows Programming Conference For Macintosh Developers. San Jose. Microsoft. Call: 1-800-421-2388.

January 16 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James. Call: 1-800-685-1400.

January 20 SEF Dinner Meeting And Presentation: How To Incorporate Workflow Technologies Into Software Products. Palo Alto. SEF. Call: Barbara Cass, (415)854-7219.

January 21 1993 Tri-Valley Adobe Technology Exchange Meeting. Pleasanton. ATX. Call: (510)417-4185.

January 24 Bay Area's Best Computer Sale. Ft. Mason. Discount Merchandising Corp. Call: (510)490-4665.

January 25-28 Client/Server '93 Conference & Exposition. San Jose. CMP Publications. Call: 1-800-972-5244.

January 27 The Internet And TCP/IP Protocols: IEEE Computer Society Lecture. San Francisco. IEEE. Call: (415)905-4400.

January 28-30 Technology, Reading & Learning Difficulties Conference. Santa Clara. Educational Computer Conference. Call: (510)222-1249.

January 30 Computer Show & Sale. Cow Palace. Richard James. Call: 1-800-685-1400.

FEBRUARY

February 16-18 mobile93 Conference And Trade Show. San Jose. Technologic Partners. Call: Natalie Paulucci, (212)696-9330.

February 20 Computer Show & Sale. Oakland Coliseum. Richard James. Call: 1-800-433-7469.

February 27 Computer Show & Sale. Cow Palace. Richard James. Call: 1-800-433-7469.

February 28 Computer Show & Sale. Alameda County Fairgrounds. Richard James. Call: 1-800-433-7469.

MARCH

March 6 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James. Call: 1-800-433-7469.

March 13 Computer Show & Sale. Oakland Coliseum. Richard James. Call: 1-800-433-7469.

March 13-14 Sacramento Atari Computer Exposition. Sacramento. Sacramento ST User Group. Call: Nick Langdon, (916)723-6425.

March 27 Computer Show & Sale. Santa Clara County Fairgrounds. Richard James. Call: 1-800-433-7469.

CLASSES, SEMINARS, AND WORKSHOPS

JANUARY

January 4 ACCPAC BPI Payroll Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 4 Beginning Excel 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 5 Intro To Simply Accounting Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 5-6 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 6 Intro To FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 7 Claris FileMaker Pro I Class. San

JANUARY 12

ENGINEERING YOUR START-UP

*Computer Literacy Bookshop,
San Jose*

Dr. Michael Baird, v.p. of engineering of the \$20 million venture capital-backed start-up Computer Aided Services, Inc., of San Jose, will outline the five basics for start-up success. He will focus on the two that are particularly relevant and most frequently overlooked by the engineer/entrepreneur: the importance of market and the management team. Baird will summarize the keys to obtaining financing and creating (and keeping) your wealth. He is the author of the new release *Engineering Your Start-Up: A Guide for the Hi-Tech Entrepreneur*. Call: Computer Literacy Bookshop, (408)435-1118.

Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 7 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 8 Intro To Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 8 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 9 Connecting, Configuring, And Using Your PC Modem Class. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 9 & 16 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 11 Beginning Harvard Graphics Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 11 Beginning PageMaker Class.

Continued

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- 4MB up to 32MB
- 8K internal cache
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COMPLETE SYSTEM
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4 8 6 S X
20 / 25 MHz

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- 8K internal cache
- Landmark = 92
- Shadow RAM

COMPLETE SYSTEM
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3 8 6 S X
1 6 / 2 5

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- Landmark = 23.5/34
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Keyboard, mini-tower case or
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486DX 33/50 MHz w/64K CACHE \$579/759
486SX 20/25 MHz \$349/399
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386DX 25/33/40 MHz w/64K Cache \$319/325/335
386SX 16/25 MHz \$249/259
Add \$180 for EISA Board

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Minitower w/200 Watt	\$54
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Middle Tower w/230 Watt	\$88
Full Tower w/250 Watt	\$116
200W Power Supply	\$31
200W Power Supply	\$36
285W Power Supply	\$39
230W AT Power Supply	\$39

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VGA (800x600, 256K)	\$25
Trident 512K	\$35
Trident 1MB	\$53
Tseng ET4000	\$78
Tseng ET4000H w/Hi-Color	\$89
Orchid Fahrenheit	\$215
ATI XL w/mouse	\$135
ATI Vantage w/mouse	\$245
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Diamond Speedstar 24	\$145
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Sound Blaster Pro	\$179
Sound Galaxy Pro	\$175
Sound Galaxy NX	\$129
Sony CD ROM Kit	\$479
(w/stereo sound card & 5 CDs)	

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Teac 1.2 5.25"	\$54
Teac 1.44 3.5" w/kit	\$53
Epson Floppy 1.2, 5.25"	\$49
Epson Floppy 1.44, 3.5"	\$48

MISC.

287-10	\$40
387SX-16/25	\$69/79
387-25/33/40	\$91/95/99
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Windows 3.1 w/o mouse	\$36
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4MBx9-70 simm	\$115

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386-33 64K	\$169
386-40 64K	\$175
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486-33 64K	\$419
486-50 256K	\$599
486-33 256K Local Bus	
w/S3 Video Card	\$699

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Logitech Trackman serial	\$73
Microsoft OEM	\$49
Microsoft compatible	\$12

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Keytronic	\$35
Zeos-Like	\$32

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250MB Archive	\$195
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200MB Maxtor	\$359
340MB Maxtor	\$610
200MB/256K Cache Conner	\$288
520MB Fujitsu	\$899
1.05GB Fujitsu	\$1545

MODEMS

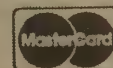
2400 baud (int)	\$33
Pocket Fax(s) Modem	\$63
Fax/Modem 9600/2400	\$65
9600 (ext. mnp5)	\$199

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14" Mono	\$90
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SVGA .39	\$235
SVGA 1024x768 .28	\$255
SVGA Non-Int	\$285
Sony 1304 Non-Int	\$560
NEC 4FG 15" Non-Int	\$745

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Calendar Of Events continued

Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 11 BPI Inventory Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 11 Intro To Macintosh Networks Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 11 Intro To MS-DOS 5.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 11 Intro To WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 11 PenPoint Programming Class. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 11 Supporting System 7 Class. San Jose. Abacus Training. Call: (415)974-7200.

January 11 X Windows And Motif Intensive: A Hands-on Workshop. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 12 Aldus PageMaker II Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 12 Beginning QuarkXPress Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 12 Intro To Data Communications Class. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 12 Intro To IBM Class. Palo Alto.

California Computer Time. Call: 1-800-959-1777.

January 12 Intro To Networks Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 12 Intro To The Macintosh Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 12 Intro To UNIX Class. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 12 Intro To Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 12 LAN Fundamentals Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 12 PowerPoint For Windows Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 12-13 UNIX Course: How It Works, What It Does, & What It Can Do For You. San Francisco. UC Berkeley Extension. Call: (510)642-6117.

January 13 Macintosh Basics Class. Santa

Continued

JANUARY 24

"BAY AREA'S BEST COMPUTER SALE"

Fort Mason, San Francisco

Discount Merchandising announced a new series of computer sales to be held every month at Fort Mason. The first sale will be Sunday, January 24 and will feature products for Macintosh computers. Admission is free with any announcement or advertisement announcing the sale. Otherwise admission cost is \$2.00. Call: (510)490-6335.

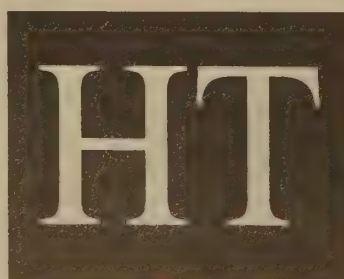
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Jan. 29, 10am-12pm - Video Editing with Matrox Personal Producer
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ELECTRONICS
computer systems

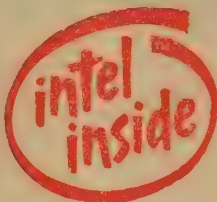
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- Maxi-Switch 101 Enhanced Keyboard
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- Mini Tower case
- 486 with Middle Tower case
- DOS 5.0, WINDOWS 3.1 & Mouse

AMD 386DX-40 \$1400
INTEL 486DX-33 \$1670
INTEL 486DX-50 \$1890
INTEL 486DX2-66 \$1960

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- Maxi-Switch 101 Enhanced Keyboard
- 2 serial, 1 parallel, 1 game ports
- Mid Tower case with 2 Fans
- DOS 5.0, WINDOWS 3.1 & Mouse

INTEL 486DX-33 \$1950
INTEL 486DX-50 \$2130
INTEL 486DX2-66 \$2200
 ■ Optional: IDE Caching Disk Controller with 0.3ms Access Time & 2 Meg Cache

Warranty

- ◆ 2 years parts
- ◆ 5 years labor
- ◆ 30 day money back

Services

- ◆ Unlimited Free Tech Support
- ◆ No surcharge for Credit Cards
- ◆ No charge until Shipping
- ◆ Express Replacement of Parts
- ◆ Free Software Installation
- ◆ Ship Within 48 hours
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- ◆ 1 Meg SVGA with 16.7 Million Colors
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- 120 MB IDE Hard Drive
- TEAC 1.44 & 1.2 MB Floppy Drive
- CTX 14" 1024NI SVGA with .28DP
- 24 bit Windows Accelerator with 16 million colors
- Maxi-Switch 101 Enhanced Keyboard
- 2 serial, 1 parallel, 1 game ports
- Mini Tower or Desktop Case
- DOS 5.0, WINDOWS 3.1 & Mouse

AMD 386DX-40 \$1220
INTEL 486DX-33 \$1470
INTEL 486DX-50 \$1680
INTEL 486DX2-66 \$1750

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- 210 HDD Lowest
- 386DX-40 MB+CPU Lowest
- 486DX-33 MB+CPU Lowest
- 486DX-50 MB+CPU Lowest
- 486DX2-66 MB+CPU Lowest
- 486EISA MB+CPU Lowest
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 - 101 Enhanced Keyboard
 - 1MB Trident SVGA Card
 - Non-interlaced 14" 1024*768, .28 dot SVGA monitor
 - 3 Button Mouse
- Ask for your own configuration!

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 - 1.2MB 5.25" and 1.44MB 3.5" Floppy Drives
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 - 2 Serial, 1 Parallel, and 1 Game Ports
 - Real Time Clock w/Battery Backup
 - Mini tower or Desktop Case with Power Supply (Digital Display)
 - 101 Enhanced Keyboard
 - 1MB Trident SVGA Card
 - WEN 14" 1024*768, .28 dot SVGA monitor
 - 3 Button Mouse
- Ask for your own configuration!

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**486-33
w/ Cytix CPU
\$1300**

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 - Mini tower or Desktop Case with Power Supply (Digital Display)
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 - 3 Button Mouse
- Ask for your own configuration!

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PS 386DX-33MHz 64K Cache System

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 - 2 Serial, 1 Parallel, and 1 Game Ports
 - Real Time Clock w/Battery Backup
 - Mini tower or Desktop Case with Power Supply (Digital Display)
 - 101 Enhanced Keyboard
 - 1MB Trident SVGA Card
 - WEN 14" 1024*768, .28 dot SVGA monitor
 - 3 Button Mouse
- Ask for your own configuration!

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PS 386SX-25MHz System

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- 2 Serial, 1 Parallel, and 1 Game Ports
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- Mini tower or Desktop Case with Power Supply (Digital Display)
- 101 Enhanced Keyboard
- VGA Monitor w/VGA Card
- 3 Button Mouse

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Ask for your own configuration!

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- 3 Button Mouse.....\$9.50
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- 14400 FAX/ 14400 MODEM\$220
- 9600 FAX/ 9600 MODEM\$205

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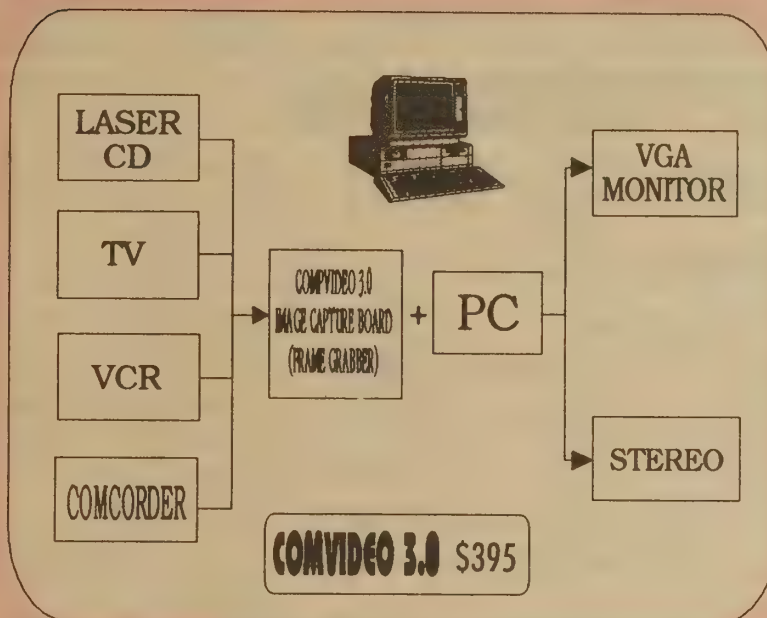
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Accelerator Card\$140.00
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120MB/250MB Colorado
Tape Backup Drive
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3M 2120 Tape 23.00
SONY CD ROM \$319.00

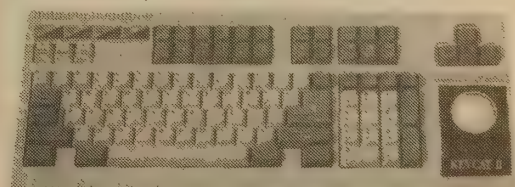
MISC.

AT IO (2S/1P/1G) \$15.00
IDE Controller \$15.00
IDE/IO Card \$25.00

Sound Commander EX
W/Speaker \$75.00
Sound Commander FX
W/Speaker \$98.00

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Windows 3.1 Package \$40.00

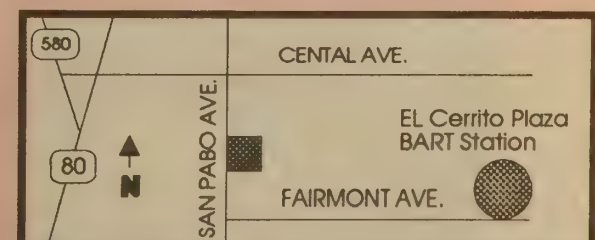
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Taiwan: 0080-149-224

Calendar Of Events continued

Clara. UCSC Extension. Call: (408)748-7375.

January 13 Persuasion For Windows Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 13 Quattro Pro Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 13 WordPerfect For The Legal Profession Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 13-15 Novell System Supervisor 3.11 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 14 Adobe Illustrator II Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 14 Beginning Word 2.0 For Windows Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 14 Claris FileMaker Pro II Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 14 Intro To Excel Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 14 Principles Of Software Engineering Class. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 15 Beginning FileMaker Pro For Windows Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 15 Intro To Computers Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 15 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 18 Beginning dBASE IV Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 18 Beginning Persuasion Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 18 HyperCard Intro Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 18 Intro To WordPerfect For Windows 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 19 Beginning PageMaker Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 19 Beginning Paradox Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 19 Beginning Windows Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 19 BPI Point Of Sale Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

Continued

JANUARY 30

CALIFORNIA COMPUTER SHOW & SALE

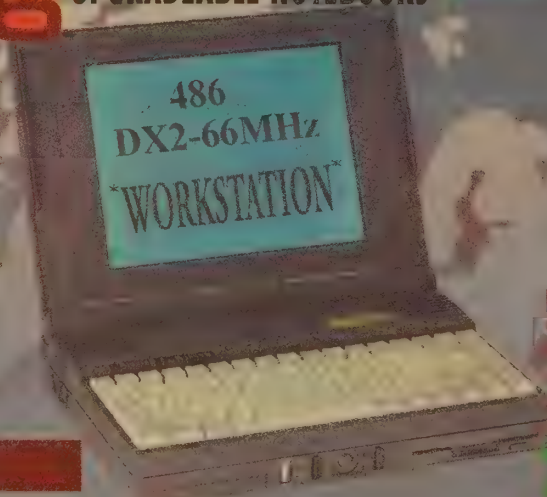
Cow Palace

The California Computer Show and Sale at the Cow Palace features over 125 exhibit spaces, making it the second largest one-day show in the Bay Area. You will find direct importers and manufacturers offering the latest software and peripherals at up to 80% off retail cost. Admission is \$6.00. Call: 1-800-685-1400.

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- 170 MB IDE HARD DRIVE
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January 19 Design For General Printing And Desktop Publishing Class. Oakland. Laney College Graphic Arts Dept. Call: Bill Leal, (510)464-3263.

January 19 Electronic Paste-up Class. Oakland. Laney College Graphic Arts Dept. Call: Bill Leal, (510)464-3263.

January 19 Electronic Publishing Class. Oakland. Laney College Graphic Arts Dept. Call: Bill Leal, (510)464-3263.

January 19 HyperCard Intro Class. San Jose. Abacus Training. Call: (415)974-7200.

January 19 Intro To Macintosh Networks Class. San Jose. Abacus Training. Call: (415)974-7200.

January 19 Intro To The Macintosh Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 19 Intro To WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 19 Supporting System 7 Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 19-20 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 19-February 9 MacroMind Director Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 20 Beginning Approach Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 20 Beginning QuarkXPress Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 20 Beginning Quattro Pro 3.0/4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 20 Intro To MS Word Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 20 Intro To WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 20-21 Microsoft Project For Windows Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 20 & 22 4th Dimension Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 21 Aldus FreeHand I Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 21 Intermediate Approach Class. San

Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 21 PowerPoint Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 21 WordPerfect Desktop Publishing Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 21-22 How To Design, Write & Publish Effective Newsletters Seminar. San Jose. San Diego State University, Extended Studies. Call: (619)594-5669.

January 22 Intermediate DeltaGraph Professional Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 22 Intermediate Excel Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 22 Intermediate FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 23 Advanced Quark Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 25 Aldus PageMaker I Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 25 CA-Up-To-Date Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 25 C Language Programming Class. Santa Clara. UCSC Extension. Call: (408)748-7375.

January 25 Macintosh Network Administration Class. San Jose. Abacus Training. Call: (415)974-7200.

January 26 Advanced FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

January 26 Beginning Harvard Graphics Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 26 Beginning Persuasion Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 26 Intro To Simply Accounting Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 26 PowerPoint Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 26-27 Local Area Networks: LANtastic To Novell Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

January 26-28 NetWare 386 Administration

(v3.1 & v3.11) Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 27 Freelance For Windows Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 27 Intermediate MS Word Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 27 Intermediate Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 27 Intro To The Macintosh Class. San Francisco. The Microcomputer Training Company. Call: 1-800-999-9654.

January 27 Intro To WordPerfect 5.1 Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 28 CA-Textor Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 28 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 28 Telemagic Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 28-February 4 PhotoShop Intensive Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

January 29 FileMagic Class. Palo Alto. California Computer Time. Call: 1-800-959-1777.

January 29 Intermediate Approach Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 29 Intermediate Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 29 Intermediate PageMaker Class. Walnut Creek. The Microcomputer Training Company. Call: 1-800-999-9654.

January 29 Macintosh Network Administration Class. San Francisco. Abacus Training. Call: (415)974-7200.

January 30 Doing Business In The Emerging Multimedia Industry Class. Santa Clara. UC Santa Cruz Extension. Call: (408)748-7375.

January 30 Fundamentals Of Video Technology Class. Santa Clara. UC Santa Cruz Extension. Call: (408)748-7375.

FEBRUARY

February 1 Aldus PageMaker II Class. San Francisco. Media Alliance/Computer Access. Call: (415)441-2557.

February 1-2 Microsoft Project For The Mac Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 2 Claris FileMaker Pro I Class. San

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NEC 4FG 15" Flat Screen	\$750
SONY 1304s .25 non-int	\$570
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Calendar Of Events continued

Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 2-3 HyperCard Stack Development Class. San Jose. Abacus Training. Call: (415)974-7200.

February 2-3 Successful GUI Migration Strategies Seminar. San Francisco. DCI. Call: (508)470-3880.

February 3 Beginning dBASE IV Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 4 Intro To FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 4-5 Effective GUI Design Seminar. San Francisco. DCI. Call: (508)470-3880.

February 4-5 HyperCard Stack Development Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 5 Beginning Excel 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 6 IBM PC Clone Hardware Upgrade Seminar. Oakland. Excel Micro Solutions. Call: (510)836-2040.

February 8 Intro To Macintosh Networks Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 8 Intro To QuarkXPress Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 8 Supporting System 7 Class. San Jose. Abacus Training. Call: (415)974-7200.

February 8-9 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

February 9 Claris FileMaker Pro II Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 9 Intro To Macintosh Networks Class. San Jose. Abacus Training. Call: (415)974-7200.

February 9 Supporting System 7 Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 10 Aldus PageMaker I Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 10 LAN Fundamentals Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 11 Intro To MS-DOS 5.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 11-12 Local Area Networks: LANtastic To Novell Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

February 12 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 13-15 Novell System Supervisor 3.11 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 15 Beginning Quattro Pro 3.0/4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 15-16 PC Repair Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

February 16 Intermediate Excel 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

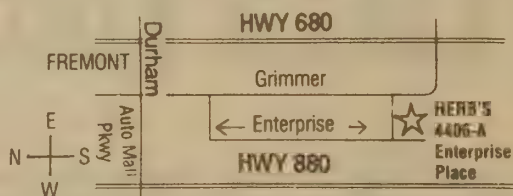
February 16 Intermediate FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 16 Intro To MS Word Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

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Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 17 Aldus PageMaker II Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 17 Intro WordPerfect For Windows 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 17 NetWare For The User Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 18-19 Local Area Networks: LANtastic To Novell Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

February 19 Adobe Illustrator I Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 19 Beginning Word 2.0 For Windows Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 19 Macintosh Network Administration Class. San Francisco. Abacus Training. Call: (415)974-7200

February 20 Intermediate QuarkXPress Class. San Francisco. Media Alliance/Com-

puter Access. Call: (415)441-2557.

February 23 Intermediate MS Word Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 23-24 Finkelstein's Practical Guide To Client/Server DBMS Computing Seminar. San Francisco. DCI. Call: (508)470-3880.

February 23-24 NetWare 386 Advanced Administration (v3.1 & v3.11) Class. San Francisco. Abacus Training. Call: (415)974-7200.

February 24 Aldus FreeHand I Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 24-25 Microsoft Project For The Mac Class. San Jose. Abacus Training. Call: (415)974-7200.

February 24 & 26 4th Dimension Class. San Jose. Abacus Training. Call: (415)974-7200.

February 25 Macintosh Network Administration Class. San Jose. Abacus Training. Call: (415)974-7200.

February 26 Adobe Illustrator II Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

February 26 Advanced FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

February 27 IBM PC Clone Hardware Upgrade Seminar. Oakland. Excel Micro Solutions. Call: (510)836-2040.

February 27 Intro To QuarkXPress Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

MARCH

March 2 Intro To QuarkXPress Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

March 3 Aldus FreeHand II Class. San Francisco. MediaAlliance/ComputerAccess. Call: (415)441-2557.

March 4 Intro To FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

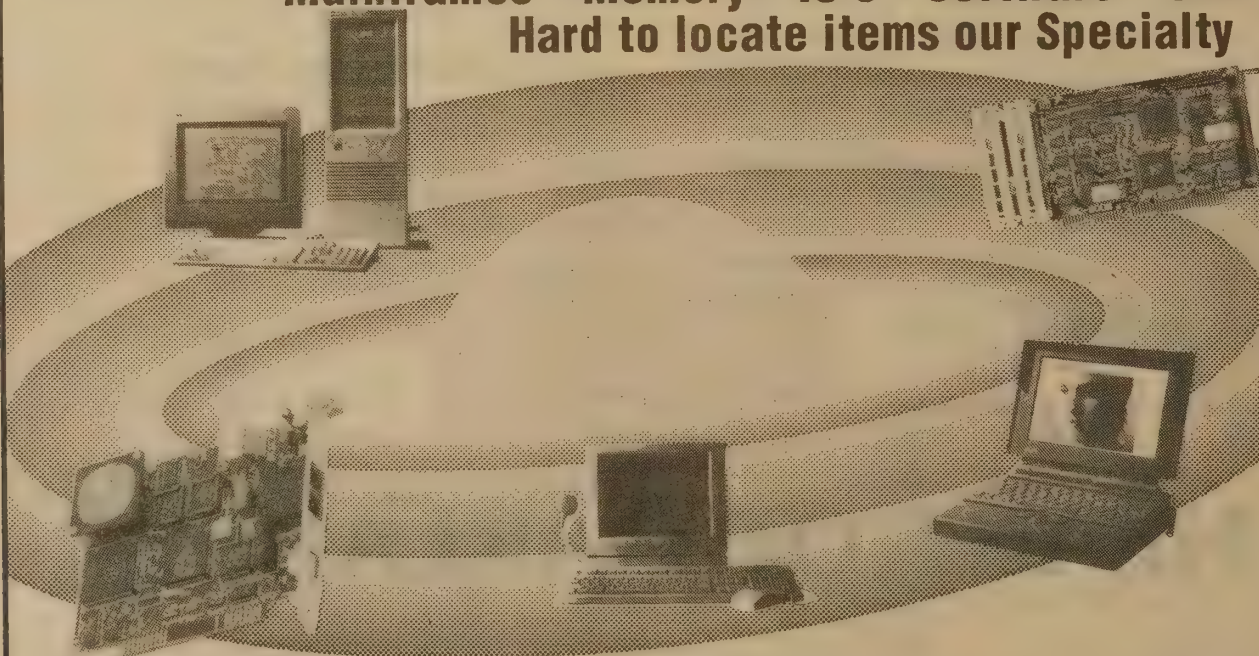
March 5 Beginning Excel 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

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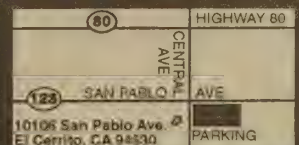
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March 9 Intermediate QuarkXPress Class. San Francisco. MediaAlliance/Computer Access. Call: (415)441-2557.

March 9 Intro To Macintosh Networks Class.

San Francisco. Abacus Training. Call: (415)974-7200.

March 9 Intro To MS-DOS 5.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 10 Intro To Macintosh Networks Class. San Jose. Abacus Training. Call: (415)974-7200.

March 10-12 Novell System Supervisor 3.11

Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 11 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 12 Intermediate FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 13 Advanced Quark Class. San Francisco. MediaAlliance/Computer Access. Call: (415)441-2557.

March 15 LAN Fundamentals Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 16 Beginning Quattro Pro 3.0/4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 17-18 Microsoft Project For Windows Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 18 Beginning Word 2.0 For Windows Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 19 Intro To WordPerfect For Windows 5.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 19 Macintosh Network Administration Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 22 HyperCard Intro Class. San Jose. Abacus Training. Call: (415)974-7200.

March 23 Intermediate Quattro Pro 3.0/4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 24-25 4th Dimension Class. San Jose. Abacus Training. Call: (415)974-7200.

March 24-25 CorelDRAW Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 24-26 NetWare 386 Administration (v3.1 & v3.11) Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 25-26 HyperCard Stack Development Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 26 Advanced FoxPro 2.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

March 29 NetWare For The User Class. San Francisco. Abacus Training. Call: (415)974-7200.

March 30 Macintosh Network Administration Class. San Jose. Abacus Training. Call: (415)974-7200.

March 30-31 4th Dimension Class. San Francisco. Abacus Training. Call: (415)974-7200. ■

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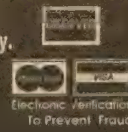
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209

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408

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Cruzio. (408)423-9995. 8-N-1, 1200/2400/9600. Santa Cruz county email, USENET and scruc newsgroups, databases, files, MUD/chat. Sysop: Peggy Dolgenos. [Exp. #104.]

Crystal Caravan BBS. (408)263-0782. 8-N-1, 1200/2400/9600/14,400. Online games, PC files, Amiga .MOD files, etc. Free. Sysop: Dynax. [Exp. #104.]

The Dark Side. (408)245-SPAM. 24 hrs. Free access to Usenet and UUCP mail. Since 1985. Internet: darkside.com. [Exp. #105.]

DC-To-Light. (408)262-5150. 8-N-1, 24 hrs., 300/1200/2400/9600. MS-DOS, CAD, UNIX,

Continued

BAY AREA BBSes

By Kathleen Creighton Graphics Boards

Upgrade your monitor, clean off your hard drive, invest in a high-speed modem, promise the phone company you'll start using ZMODEM or YMODEM-G protocol, and join the thousands of telecommers who are downloading GIF-format files, animations, and high-quality color graphics. The Graphics Interface Format, first developed by CompuServe, made it possible to convert a number of graphic file formats (such as .TIFF, .PCX, and .BMP) into universally displayable art or photos with the use of any one of a number of graphics viewer—and a hobby was born.

Animation viewers put animation files online, and GIFs and animations with sound will be available soon. Video clips aren't far behind. "Graphics" is synonymous with "disk hog," which means the graphics collector requires huge amounts of disk space, and that the 2400-baud modem and XMODEM protocol will make toll-call downloading in any quantity prohibitively expensive. Although they are listed in this column as having 2400-baud modems (the most common speed in use today), most graphics BBSes support high-speed modems, and almost half of serious graphics collectors use them.

Bay View Graphics BBS

Bay View Graphics BBS sysop Bob Rider recommends starting small by downloading the smallest files available to see if the hobby is appealing. His BBS carries a variety of GIF, animation, and high-color (16- or 24-bit) files, plus BRRAnet (pronounced "BrainNet"), an international multi-conference message network founded by Bob Rider and Robert Anderson to share information with the AutoCAD and graphics communities. Message areas include Autodesk (AutoCAD, 3D Studio, Animator support); architect, engineering, and construction area; CAD/CAM; computer graphics, ray tracing, rendering, and animation; 16/24-bit graphics information and exploration; and technical hardware and software discussions.

While Bay View Graphics is a serious BBS for the graphics professional, students and hobbyists are welcome and encouraged to ask questions in the public message areas. Although time online and number of downloads are limited each day, there is no fee for full registered user access. (Bay View Graphics BBS, 510/799-6456, 2400 baud, 8-N-1.)

Garlique Graphics BBS

Garlique Graphics BBS in Gilroy is a for-fee subscription board (per file, or \$10 minimum per month) which carries GIFs and high-color graphics, and plans to soon carry GIFs with sound.

Garlique Graphics has a novel approach to file descriptions. Instead of burdening every file with a vague or inaccurate description, as many as thirty-six GIFs are bundled into one GIF file called a Visual Catalog, along with the file names and resolution of the GIFs displayed. The catalogs can be downloaded at no charge and viewed offline, then the user can select individual images to download (for a fee). (Garlique Graphics BBS, 408/847-6750, 2400 baud, 8-N-1.)

Dr. Image BBS

Dr. Image BBS carries some (mostly technical) Fidonet message areas, and varied and well-organized download areas for GIFs, clip art, Windows, AutoCAD, and more. Sysop Eric Ho also bundles GIF files into one image for offline perusing. The registration fee is \$10 for six months, or \$15 for one year, but provision is made for unregistered access. Even the casual hobbyist is likely to find something of interest here. (Dr. Image BBS, 415/961-2839, 2400 baud, 8-N-1.)

Continued

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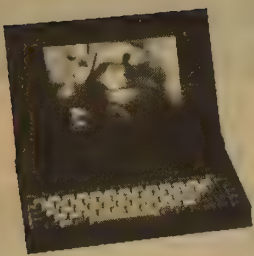
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	213MB IDE	\$383
	213MB SCSI	\$507
	340MB IDE	\$649
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	Multimedia Upgrade Kit w/Pro Audio 16	\$920
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	CDR-84, Internal CD-ROM 280ms	\$540
	CDR-74, External CD-ROM 280ms	\$605
Sony	CDU535 Internal CD-ROM AT	\$279
	CDU541 Internal SCSI Bus CD-ROM AT	\$429
	CD31A Internal CD-ROM w/ kit	\$255
Texel	DM-3024 265ms Internal	\$425
	DM-5024 265ms External	\$495

MONITORS

NEC	3FGX 15" Multisync .28 1024x768 NI	\$ 645
	4FG 15" Multisync .28 1024x768 NI Flat	\$ 745
	5FG 17" Multisync .28 1280x1024 NI Flat	\$1350
	6FG 21" Multisync 1280x1024 Flat	\$2380
Supercom	ST-1497 14" Multisync .28 1024x768 NI 75Hz	\$ 320
	ST-1791 17" Multisync .26 1280x1024 NI	\$ 849
Viewsonic	VSC6E 14" .28 1024x768 NI	\$ 350
	VSC5E 14" .28 1028x768 NI	\$ 409
	VSC6FS 15" .28 1024x768 Flat	\$ 609
	VSC7 17" .28 1280x1024 NI	\$1010
	VSC8 20" .31 1280x1024 NI	\$1510

MOUSE

Logitech	Trackman II Serial	\$ 75
	Mouseman Cordless Radio Mouse	\$ 84
Microsoft	Ballpoint Mouse for desktop	\$114
	Serial Mouse 400dpi	\$ 69

NETWORK

3COM	509 Etherlink Coax	\$133
	509 Etherlink TP	\$133
Artisoft	Lantastic 2Mbps Starter Kit	\$325
	Lantastic AE-2 Ethernet Starter Kit	\$449
Compulan	16 TP Ethernet	\$ 99
	Ethernet TP Pocket Adapter	\$169
Intel	Ethernet 10 Coax	\$131
	Ethernet 16 TP	\$131
Novell	Netware Lite & Dr. DOS 6.0	\$ 51
	Netware V3.11 5 Users	\$585
	Netware V3.11 10 Users	\$1265
	Netware V3.11 20 Users	\$1745
SMC	Elite Ethernet Plus 16 TP	\$ 135
	Elite Ethernet 16 Combo Coax/TP	\$ 163

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Colorado	DJ-10 120MB Int	\$190
	DJ-20 250MB Int	\$249
	Trakker 120MB Printer port	\$349
	Trakker 250MB Printer port	\$425

CONTROLLERS

Adaptec	AHA-1520 SCSI	\$ 72
	AHA-1522K SCSI AT w/kit	\$149
	AHA-1542B SCSI Bus master w/kit	\$255
Ultrastor	15C/1 IDE	\$239
	14F SCSI	\$209

VIDEO BOARDS

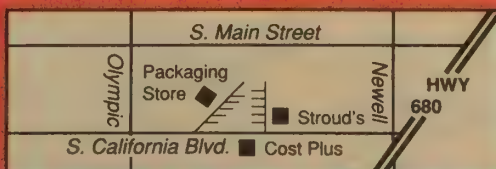
ATI	Graphics Ultra Pro 1MB	\$449
	Graphics Ultra 1MB	\$295
	Wonder XL24 1MB	\$145
Vantage	1MB	\$219
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	Diamond Stealth HI Color 1MB	\$210
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HP	ScanJet IIP	\$795
Logitech	Scanman 32	\$135
	Scanman 256	\$249
	Photoman Digital Camera	\$495
Tamarack	ArtiSCAN Flatbed Scanner Color 600DPI	\$1050
Microtek	Scanmaker II Color	\$860

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Hayes	Optima 14.4 + Fax 14.4 Ext	\$449
	Optima 96 + Fax 96 Ext	\$365
Practical P	PM14400 Int	\$355
	PM14400FXSA Ext	\$385
US Robotics	Sportster 14.4 Ext	\$310
	Sportster 9600 Ext	\$295
	Sportster 14.4 Int	\$295
Intel	Satis Faxton 200	\$295
	Satis Faxton 400	\$395
	Satis Faxton 400E	\$430



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Canon	BJ-10EX	\$ 290
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	BJ-200	\$ 345
HP	DeskJet 500	\$ 390
	DeskJet 500C	\$ 525
	DeskJet 550C	\$ 725

LASER PRINTER

HP	IIP+	\$ 775
	IIP	\$ 995
	4	\$1445
	4M	\$1995
QMS	PS410	\$1410
Panasonic	KX-P4410	\$ 649
	KX-P4430	\$ 875
	KX-P4450i	\$1055

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Aldus	Pagemaker V4.0 for Windows	\$399
Borland	Borland C++ 3.1 & Application Frame	\$485
	Paradox 4.0/Upgrade	\$489/159
	Dbase IV 1.5	\$439
	Quattro PRO Window 1.0/Upgrade	\$298/99
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Datastorm	PROCOMM PLUS for Windows	\$89
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	Word for Windows V2.0	\$299
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The Engineers' Club. (408)265-3353. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Technical files, messages, and users. Sysop: Robert K. Griffith. [Exp. #104.]

Escape To Other Worlds BBS. (408)956-1750. 8-N-1, 1200/2400/9600/14,400. Threelines, SF, fantasy, comics, games, msgs. Mac and PC GIFs. [Exp. #105.]

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HeartBeat Earth. (408)257-2306. 8-N-1, 300/1200/2400. Silicon Valley's Green online interactive publication. TechNet, WildNet, files. Sysop: Marcus Johnson. [Exp. #104.]

The Holodeck BBS. (408)248-0869. 1200/2400/9600/14,400. Online games, Fidonet, IBM files, and GIFs. Home of W&W Communication Doorware. [Exp. #106.]

Infoserve Connections. (408)243-2102. 8-N-1, 24 hrs., 2400. UUUP/Usenet/email for DOS, Mac, and 386/UNIX. Sysop: B. Oesterreich. [Exp. #104.]

The I/O Temple. (408)427-3453. 8-N-1, 1200-14,400. Msg bases, online games, and

more. FidoNet 1:216/513. Sysop: Armand. [Exp. #104.]

The Land Of Garg BBS. (408)378-5108. 8-N-1, 24 hrs., 1200/2400. Internet mail, regional newsgroups, religious file section—Roman Catholic emphasis. Sysop: Bob Van Cleef. [Exp. #104.]

The LaserBoard. (408)268-4863, 268-6323. 24 hrs., 14,400 RIME, local TNET, and Wildnet conferences. Call and download the latest file available and best service around. Free. Sysop: Shawn Higgin. [Exp. #106.]

Laser Light BBS. (408)496-0771. 8-N-1, 24 hrs., 2400/9600/14,400. IBM, best games in town! Apogee, EPIC, Moraff & MVP Release site. Sysop: Robert Mueller. [Exp. #105.]

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Monterey Gaming System. (408)655-5555. 300/1200/2400/9600. 16 lines, conferences, email, msgs., custom games. Free. [Exp. #106.]

Moose Is Loose BBS. (408)773-9573. Not many files but the silliest message base in Sunnyvale. Sysop: John Giever. [Exp. #106.]

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4595. 2400-14,400. 660MB, Fidonet member, specialty Turbo Pascal. Sysop: John Jamieson. [Exp. #106.]

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NightLog BBS. (408)655-1096, 655-8294. 24 hrs., 300-16,800. DOS, Windows, OS/2, adult files, 14 lines, 4.9GB. Sysop: Karl Van Lear. [Exp. #106.]

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Positive Image Studio. (408)270-8996, 270-8916. 8-N-1, 24 hrs., 19,200. FirstClass software, 4GB files online, Mac & IBM software and util, adult graphics/animations. Memberships avail. [Exp. #105.]

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The GIFT Shop BBS

The GIFT Shop BBS carries BRRAnet echo message areas and a large selection of mainstream and other GIFs that perhaps might be best described as less tasteful (access limited to users verified to be over 18), along with animation files, MIDI music files, and Wave and MOD sound files. Effective January 1, 1993, yearly membership dues will be \$35 and \$60 for registered and charter subscriptions respectively. (The GIFT Shop BBS, 510/689-4378, 2400 baud, 8-N-1, Waik Gan, sysop.)

Of Interest

Tiger Team BBS is a Buddhist BBS with a selection of Eastern religious art in GIF files as well as a digital tour of China available for download. (Tiger Team BBS, 510/658-0607, 2400 baud, 8-N-1, Gary Ray and Jeffrey Macko, sysops.)

Suggestions?

I'm always looking for good column ideas and interesting and unusual BBSes and networks to explore, so I'm happy to hear from you! Email casey@well.sf.ca.us, leave a message for me in the private mail area of Bay List BBS (510/339-1045); or write to me care of MicroTimes, 3470 Buskirk Ave., Pleasant Hill, CA 94523.

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Free user group and association listings are limited to the group's name and a ten-word description, including the mailing address and contact phone number. They will be **deleted at six-month intervals** to ensure timeliness and accuracy of information. **Free BBS listings** are also limited to the board's name, sysop's name, and a ten-word description including parameters, baud rate, phone number, and registration fee. Because we have an ongoing problem of boards shutting down without telling us, much to the annoyance of would-be callers and the new phone number's owner alike, we will **delete these listings after they've run three months.**

You can update or renew your listings at any time. If yours is missing, send us a new one! Send your listing information to: US Mail should go to: MicroTimes User Group, 3470 Buskirk Ave., Pleasant Hill, CA 94523. **Faxes** are welcome at (510)934-2417 or (213)467-5486. **Email** can be sent to: microx@well.sf.ca.us. Or MCI:MICROTIMES.

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GUI Greats are About to Gather at the Windows & OS/2 Conference



IBM Strategy Briefing

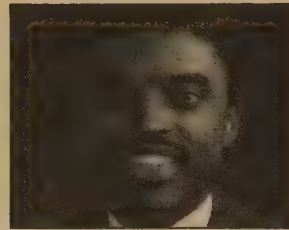
Wednesday, January 20th, 4:00-5:00pm

IBM's Overall Software Strategy Today, Tomorrow...and Beyond

By Lee Reiswig, John Patrick and Lois Dimpfel

Lee Reiswig, Assistant General Manager, Personal Systems Programming

Here it is—IBM show-and-tell! See firsthand a broad range of extensions, including the latest technology incorporated into shipping OS/2 products, OS/2 beta, and associated development software. Included will be future enhancements to the operating system, multimedia extensions, development tools, LAN systems, database manager, communications software, systems management tools & enablers, and more.



Microsoft Strategy Briefing

Thursday, January 21st, 4:00-5:00pm

Enterprise Computing Strategy for the '90s

By Dwayne Walker

Dwayne Walker
Director of CNS Marketing & Development

Here's what you have been waiting for: an update on Microsoft's "Information at Your Fingertips" strategy and a look at Microsoft's Workgroup and Client Server Computing Strategy. In addition, you'll get a detailed update that covers Windows, Windows for Workgroups, Windows NT, SQL Server, and LAN Manager.

If you're concerned about the future of graphical environments for PC computing, you simply must attend the Microsoft Strategy Briefing and the IBM Strategy Briefing at the Windows & OS/2 Conference. The information you get from just these two sessions

could set your course for years to come. Together with the 65-plus Conference sessions, Tutorials and new Solutions Samplers, and a power-packed exhibition floor, you can see, learn and discover the new world of Windows and OS/2 in more depth than ever.

Keynote Address

Wednesday, January 20
9:00-10:00am

Michael Schrage, author of *Shared Minds: The Technologies of Collaboration* and weekly columnist for the *Los Angeles Times*



Plenary Session

Thursday, January 21
9:00-10:00am

Fred Langa
Editor-In-Chief of
Windows Magazine



Developer's Keynote

Friday, January 22
9:00-10:00am

Gordon Eubanks
President and CEO of
Symantec Corporation



The Myth of the Information Age: Creating Organizational Operating Systems

Groupware is heralded by info gurus as the most significant new vehicle to wring value from enterprise computing. But do organizations—and the people who sell information technology to them—really understand value? Is "information technology" the appropriate medium to manage what are basically challenges in organizational relationships? This presentation will offer a new perspective on what the real potential and future of groupware might be—and why the best groupware may not even turn out to be groupware after all. This talk is intended for people who are responsible not just for investing in new technologies, but for making sure that the enterprise gets a palpable, measurable return on those investments.

Who's Papering Over GUI Cracks? (or, I can't get the #&\$% software to work)

The user interface is the key to unlocking the power of Windows and OS/2 for both single users and workgroups. But Microsoft, IBM, Lotus, and Borland are changing the locks! They have different ideas about what makes a good user interface. As they head in different directions, users may get left in the dust as applications actually become harder to make work together, and data becomes harder to share—the opposite of what graphical user interfaces are supposed to do. Here's your chance to hear what's really behind these and other changes as interface designers from major software companies explain their choices and answer questions about ease-of-use, training/retraining, and interoperability in the next releases of their software.

Software Development in a Multiplatform World

Software development faces a growing challenge: proliferation of multiple desktop platforms, increasing heterogeneity of corporate installations, and growing competition in a global marketplace. As veteran of the software industry, Gordon Eubanks knows what works and what doesn't in meeting today's software development challenges. He will discuss efforts to develop an applications framework solution (The Bedrock Technology™) that speeds cross-platform development, aids in the use and reuse of code, and accelerates localization of products for a global market.

Napa Valley Wine Tour Don't miss the exclusive Napa Valley Wine Tour and private exhibits viewing on Wednesday, January 20th at 6pm. Meet one-on-one with representatives from over 250 exhibiting companies.

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2400. Lifestyle bulletin, adult chat, email, library (18 over only). Reg. required. Sysop: Dave. [Exp. #106.]

The Village. (408)229-7060. 2400/9600/16,800. Over 100 online games, 800MB. Full access with first call. Sysop: Michael Wilson. [Exp. #106.]

The Who Knows? BBS. (408)262-3634 (14,400), 262-1364 (9600). Specializing in worldwide messaging and online games. Sysop: Johnny Bowen. [Exp. #104.]

415

1st Pacific Computer & Software Exchange. (415)759-6341. 24 hrs., Buy, sell, trade, new, used. Quick D/L of all info & list. Free. Voice: (415)759-6070, 2-6 pm. [Exp. #106.]

4 Corners BBS. (415)989-7957. 24 hrs., 300/1200/2400/9600/14,400. Online games, 5000+ files, msgs, doors. Free access, low rates. Sysop: Stephen Kurtz. [Exp. #104.]

5 Star BBS. (415)681-1172. 8-N-1, 24 hrs., 1200/2400/9600. Music, GIFs, games, adult, animation, shareware files. Sysop: Peter Lau. [Exp. #106.]

38 North/122 West. (415)343-7517. 24 hrs., 14,400. Sailing, interracial couples, doors, boat for sale ads. Sysop: Martin Schaff. [Exp. #105.]

ABACUS (Atari Bay Area Users Society). (415)587-8062. 300/1200/2400. For 8-bit and ST/TT users. [Exp. #104.]

AIDSInfo BBS. (415)626-1246. 8-N-1, 24 hrs., 1200/2400. 32MB dBASE with index, The-saurus keyword search, online help instructions (no chat). Topics on AIDS including read/write discussions, periodicals, news articles, resource contacts, private email between users. Sysop: Ben Gardiner. [Exp. #106.]

ALIEN BBS. (415)359-8774. 8-N-1, 24 hrs., 1200-14,400. Amiga/IBM/Mac info. Adult boards w/registration. Free. Sysop: Ed Vandehey. [Exp. #104.]

Anatomically Correct BBS. (415)856-8425. 24 hrs., 2400. Free, adults only, unique "chat," dozens of articles & message base. Sysop: Howieird. [Exp. #105.]

Altitude Online. (415)712-0501. 8-N-1, 1200/2400. Email, technical software/hardware gurus, files. No fees. Sysop: Ray Taft. [Exp. #105.]

Back Door For Bi/Straight Men & Women. (415)756-8452. 8-N-1, 24 hrs. 10 lines, 18 and over only. [Exp. #106.]

Back Door For Gay/Bi Men. (415)756-6238. 8-N-1, 24 hrs. 33 lines, alt lifestyles, 18 and over only. [Exp. #106.]

Back Door For Lesbian/Bi Women. (415)756-8426. 8-N-

1, 24 hrs. 10 lines, alt lifestyles, 18 and over only. [Exp. #106.]

BAHUG BBS. (415)326-4486. 8-N-1, 24 hrs., 300/1200/2400. DTP info and help for Heath/Zenith machines. Free. Co-Sysops: Freeman Bradford and Ed Hayes. [Exp. #104.]

Bay Area Luv Connection. (415)822-7220. 24 hrs. Adult board, 16 lines. Fee. Voice: (415)239-1028. [Exp. #105.]

BBS Of San Francisco Apple Core. (415)563-8652. 24 hrs., 2400. Lots of fun, supports Apple II and GS computers. [Exp. #106.]

California ConneXion Partyline. (415)927-2739. 8-N-1, 23.5 hrs., 300/1200/2400/9600/14,400. Nine lines, 400MB, group chat, worldwide network, 40+ pubs, matchmaking, adults only. Reg required. [Exp. #106.]

California Online! (415)898-2565. 14,400. Multiline, chat, InfoNet, \$\$Contests, adult, GIFs, 1.8GB. Free & reg access. Sysop: Jim Thornson. [Exp. #106.]

Campool BBS. (415)948-8928. 9600. IBM/MS-DOS file exchange, three lines w/2800 files. Los Altos. Sysop: Andy Bajka. [Exp. #106.]

Charisma. (415)349-6576. 1200-14,400. Full reg. first call, four nodes, thousands of useful files. ALL ILink, SmartNet & Intelac conferences. Sysop: Tom Swegles. [Exp. #104.]

Clinton For President. (415)641-4465. 8-N-1, 300/1200/2400. SF Clinton Committee: How the Clinton Presidency will change America, campaign info. [Exp. #104.]

Clipboard. (415)239-0454. 8-N-1, 3pm-11pm. For Clipper and xBASE programmers and developers. 100MB+ files. [Exp. #106.]

CompUCall. (415)703-1297. 7-E-1, 1200/2400. California's Public Utilities Commission's calendars, decisions, releases. [Exp. #104.]

Computer Show Hotline. (415)340-9370. 8-N-1, 1200/2400. Latest Computer Show info. Complete list of dates, times, locations, and directions. [Exp. #105.]

Covert Operations. (415)897-1880. 24 hrs., 1200/2400/9600. Wildcat 3.55, growing Marin BBS, WildNet, adult GIFs. Free. [Exp. #106.]

DPNetBBS. (415)788-8663. 8-N-1, 24 hrs., 300/1200/2400/9600. Free consultant job listings, Fidonet conferences, professional computing organizations, and technical SIGs. All welcome. [Exp. #106.]

The Elfspire Tome BBS. (415)595-2387. 1200/2400/9600. A fantasy role-playing G.M. resource bulletin board featuring role-playing, games, fantasy clipart, and more. [Exp.

#104.]

Fog City. (415)863-9697. 8-N-1. Gay & Lesbian community, chat, matchmaking, CD-ROMs, games, 2.4GB. Since 1986. [Exp. #105.]

Golden Gate Computer Society BBS. (415)927-1216. 24 hrs., 2400-14,400. Four lines, toll free for SF, East Bay. Member of ILink & Baylink message networks. [Exp. #104.]

Graveyard Shift BBS. (415)923-9060. 14,400 Adult-oriented theme, GIFs, animation's, msg., texts. [Exp. #106.]

Griffin DataFast. (415)327-5156. 8-N-1, 24 hrs., 1200/2400/9600/14,400. OS/2, DOS & Windows files, messages. OS/2 FAQ Hardware at wholesale. Sysop: Scott Williams. [Exp. #104.]

Guideboard. (415)864-3858. 24 hrs., 300/1200/2400. Multiline, Cabbie's Guide to SF restaurants, doctors, auto repair, etc. Sysop: Dick Schwartz. [Exp. #106.]

Hispanic On-Line Access—HOLA. (415)252-0285. 8-N-1, 8:00 am-9:00 pm, 300/1200/2400. Hispanic issues, software, business, Latin America news. Free. [Exp. #105.]

IBBS West. (415)564-9998. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. PC and compatibles, utils., adult GIFs, CD-ROM w/10,000 files, free trial. [Exp. #106.]

Incipits Remote BBS. (415)324-2601. 1200-38,400. Tons of shareware for DOS, OS/2, and UNIX. Distribution point for 386BSD PD UNIX OS. Specializing in network, programming, and multi-OS shareware. [Exp. #106.]

InfoDude BBS. (415)855-9500. 24 hrs, 2400. In Palo Alto. Teleconferencing, forums, matchmaking, and flash games. Windows, Mac, and Amiga files. Sysop: Joseph A. Jenkins. [Exp. #106.]

The Informer BBS. (415)468-6713, 468-9913. 24 hrs., 2400-14,440. Operations systems, tech specs, conferences, drive & controller specs, driver updates. Call-back verifier. Sysop: John Custer. [Exp. #105.]

KALW-FM BBS. (415)641-4373. Political discussions, Human Rights Reports, and listener feedback. [Exp. #106.]

Legal Information Systems. (415)331-7220. 8-N-1, 2400. Text of recent CA and CA App cases. Reg Req. [Exp. #105.]

Lies Unlimited. (415)583-4102. 2400. Politics and polemics. NIRVANAnet. Instant access, no fee. [Exp. #106.]

MacDungeon BBS. (415)584-0216. 300/1200/2400. Mac, IBM files, XXXGIFs, anarchy. Free. Sysop: PumpkinHead. [Exp. #106.]

Mac World BBS. (415)824-8104. 300/1200/2400. Mac/IBM files, discussion, and lots of messages. All ages welcome. Free. Sysop: Archbishop. [Exp. #104.]

Marin County Net. (415)331-6241. 24 hrs., 2400-16,800. Aviation, sailing, weather, Fidonet conferences. Free. [Exp. #106.]

Media Literacy BBS. (415)621-5156. 8-N-1, 24 hrs., 300/1200/2400. Online resources for educators and others interested in media education. Sysop: Kathleen Tyner. [Exp. #106.]

The MIDI & Multimedia Exchange BBS. (415)771-1788. .MID/.MOD & Synth Patch Libraries. [Exp. #106.]

The New Dork Sublime. (415)566-0126. Good news for new dorks everywhere. NIRVANAnet. [Exp. #106.]

New Earth BBS. (415)878-9157. 8-N-1, 24 hrs., 1200-14,400. PC Pursuitable via CASFA, files, national & international conferences. Free. Sysop: Romano Dikerson. [Exp. #104.]

Pacific Vision BBS. (415)324-3780. 8-N-1, 300/1200/2400. Jobs and business online, community events, discussion lounge, rent a board. [Exp. #105.]

The Pink Triangle. (415)921-7609. 8-N-1, 24 hrs., 2400. New gay men's BBS: issues, dating. [Exp. #106.]

The Play-Pen BBS. (415)897-3073. 8-N-1, 24 hrs., 1200/2400. BBS-Chess, MarkMail. Free. Sysop: Paul Ward. [Exp. #106.]

Recovery BBS. (415)255-2188. 8-N-1, 300/1200/2400. AA, NA, Al-Anon/ACA, SLAA. Recovery and 12 Step Echos. Fido 125/9. Sysop: Rich Gorlin. [Exp. #104.]

Robotics Society Of America BBS. (415)648-6427. 24 hrs., 1200. Sysop: Rob Stevens. [Exp. #105.]

The Rolling Thunder BBS. (415)593-9790. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. IBM, GIF, and sound files. Lots of Doors, Star Trek and BSA conferences. Sysop: Kevin and Scott. [Exp. #106.]

The Sanctum. (415)753-6861, 731-9859. Food for thought—discussion and debate. No reg. fee, voice validation req. [Exp. #105.]

San Francisco PC User Group BBS. (415)621-2609. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Sysop: Richard Couture. [Exp. #106.]

SearchNet International BBS. (415)873-5336. Gov't files, FCC watchdog, free speech, politics, nonprofit group material accepted. Voice: (408)236-3706. Sysop: James P.

Leonard. [Exp. #104.]

SF Cacophony Society. (415)776-5513. 8-N-1, 19:00-07:00, 2400. Adventures beyond the pale of mainstream society. Free. [Exp. #106.]

SF Net. (415)824-8747, 589-2194, 332-3923, (510)450-0155, 638-8644. CoffeeHouse/Cafe Connection, 30 lines, chat, matchmaker, msg areas, Fido 1:125/824, UUCP Connection. [Exp. #106.]

Skeptic's Board. (415)572-0359. Science and fringe science. Internet/Usenet access. San Mateo. Sysop: Rick Moen. [Exp. #104.]

The Skull. (415)637-9077, 692-7721. 2400-16,800. Palo Alto/SF, multiline, GIFs, games. Since 1985. [Exp. #105.]

SMUG (Stanford-Palo Alto Mac User Group) BBS. (415)856-0210. BBS on Threshold 2000, uses Telefinder GUI. [Exp. #105.]

Space BBS. (415)323-4193. 10 lines, Internet email, 2000 newsgroups, stocks, 50,000 files. Free downloads. Sysop: Owen Hawkins. [Exp. #106.]

Starnet Connections. (415)949-3133. 8-N-1, 24 hrs., 300/1200/2400/9600. Los Altos. Email, USENET, UNIX, and more. Sysop: Richard Mahn. [Exp. #106.]

The StrongHold BBS. (415)992-2860. 24 hrs., 1200/2400/9600/14,400. Files, messages, games. Calnet/Hogenet. Sysop: Chris Jong. [Exp. #106.]

The System. (415)369-5144. 8-N-1, 24 hrs., 300/1200/2400/9600. Accounting, AccPac, BPI, Simply, Telemagic, Novell networks, email. [Exp. #105.]

TECNET. (415)390-9279. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Two lines, technical help w/testing equipment, classified ads, graphical, new board. Extra for subscribers. Sysop: John E. Fisher II. [Exp. #106.]

TimeStream Historical/Gamers BBS. (415)666-0471. 300-19,200. For RPGers, GMs, Cacophony, SCA, and FaireFolk. Fidonet, Shadownet, email. Historical interest group areas. Sysop: William Watters. [Exp. #106.]

Toad Hall BBS. (415)595-2427. Intelac, Smartnet, Rime & Calnet networks. [Exp. #105.]

The Trade Center BBS. (415)340-7261. 24 hrs., 14,400. Games, utils., 600MB of GIFs, adult and general areas, conferences, and more. Sysop: Gabriel Turk. [Exp. #106.]

Uncle D's Directory. (415)364-3001. 8-N-1, 24 hrs., 1200/2400/9600. Software for deaf & education, msgs, file search, classified ads, doorways. No fees. [Exp. #106.]

VA Listings. (415)744-7793.

24 hrs., 300/1200/2400. VA-owned homes for sale. Multiline. Sysop: David Piersall. [Exp. #104.]

VidGame BBS. (415)742-6441. 2400-14,400. 3900 GIFs, music files, doors, 290+ conferences, utilities. Over 2.3GB. Sysop: George Hassmer. [Exp. #105.]

The Wasteland BBS. (415)382-7916. 300/1200/2400. Online games, GIFs, and more. Sysop: Hell Raiser. [Exp. #104.]

Wetware Diversions Public UNIX. (415)826-0397. 8-N-1, 24 hrs., 1200/2400. Full Usenet news, eight lines. Sysop: Eric Swason (editor@wet.UUCP). [Exp. #106.]

Windows NT Online Support. (415)572-9661. 300/1200/2400/9600/14,400. MS Windows NT support, messages, files, WINNTNET. Sysop: Bruce Chester. [Exp. #106.]

WindowWorld BBS. (415)931-0649. 24 hrs. For people who use Windows-type software. Info., shareware, chat. Sysop: Bob Cram. [Exp. #106.]

Zen Connection. (415)389-9245. 1200/2400/9600/14,400. Open to all Spiritual seekers. Meditation topics, living Masters, and events. Sysop: Premananda. [Exp. #106.]

510

& The Temple Of The Screaming Electron. (510)935-5845. 38,400. A safe haven for visionaries and paranoids, 100MB, NIRVANAnet. No fee. Sysop: Jeff Hunter. [Exp. #106.]

8-Bit Apple User Group BBS. (510)294-8052. 24 hrs., 300/1200/2400. Apple II ProDOS, DOS3.3, UL/DL, email. No fees. Sysop: Noel Anklam. [Exp. #105.]

AbysS Multiline Systems. (510)482-2992, 357-1974. World echos & Net mail, group & private chat, matchmaker. [Exp. #106.]

Activist. (510)532-6248. 1200/2400. Text/talk on politics, tech., consp., priv., hist., cryptog., phil., ethics, arts/NorCalNet. Sysop: Walter Alter. [Exp. #106.]

BayArea OS/2 BBS. (510)657-7948. 8-N-1, 2400/9600. OS/2 files and conferences. Free. Sysop: Greg Altman. [Exp. #106.]

BayView Graphics BBS. (510)223-3763. 300-38,400. Graphics & telecommunications files. BRRAnet echo conferences. Sysop: Bob Rider. [Exp. #104.]

Berkeley WWIV Chess BBS. (510)486-0795. 8-N-1, 2400. Chessmaster's corner, Fido International Chess Echo, USENET rec. games, chess. Sysop: Walter Wood. [Exp.

Continued

#106.]

The Big Board. (510)582-9364. 8-N-1, 24 hrs., 300/1200/2400. An alternative way for chubbies to meet chasers. For those without a computer, send a short message to the Sysop, who will put it on the board. Voice: (415)824-8254. Free. Sysop: Cliff Wilson. [Exp. #105.]

Breaking Walls; Building Bridges BBS. (510)827-0804. 8-N-1, 24 hrs., 300/1200/2400. Gay/Lesbians, church, AIDS, community forums, news, counseling. Sysop: Deacon DVMCC. [Exp. #106.]

Bust Out BBS. (510)881-5427. 24 hrs., 14,400. Four nodes, 2GB, huge msg and file network (including adult). Computer systems and software services. Sysop: Alex J. Riggs. [Exp. #106.]

California High-Flyers BBS. (510)568-9280. 8-N-1, 24 hrs., 300/1200/2400. More Bay Area numbers, nine lines, chat, email, library. Ages 10 and up. Two subscription levels. Sysop: Carl Dominic. [Exp. #105.]

Classified BBS-Net SL. (510)481-8217. Supports all systems, 2.5GB, multiline. [Exp. #106.]

Compu-Ace RBBS. (510)794-4029. 9600. Files, games, msg., Turbo Pascal Programmers conference, and more. Member of BAY-LINK. Sysop: Scott A. Mercer. [Exp. #106.]

Delta BBS. (510)778-3714. 24 hrs., 1200/2400. 40+ online games, new every week, msg bases, transfer section w/out ratios. Free Sysop: Phantom. [Exp. #104.]

The Diamond Mind. (510)791-1910. 8-N-1, 24 hrs., 300/1200/2400/9600, 14,400. Emotional support, IBM and Mac files, Fido echos, chat, online games, adult areas. Free user level. Sysop: Diamond & Frank. [Exp. #106.]

DVPCBBS. (510)943-6238. 8-N-1, 300-14,400. [Exp. #105.]

Easy Access BBS. (510)829-7627. San Ramon, Internet/Usenet/Smartnet, DOS and Windows. Subscription \$4. Free access too. [Exp. #105.]

Fantasies Adult BBS. (510)632-1590. 8-N-1, 24 hrs., 300/1200/2400. XXX—this is an adult lifestyles BBS with worldwide echo networks and local personals. [Exp. #106.]

Francofolies. (510)651-3192. 1200/2400/9600. The French BBS of the Bay Area: online games, electronic newsletter, msg in French or English. No fee. Co-Sysop: MEJV. [Exp. #106.]

Fred Haney & Sons BBS. (510)792-5119. 8-N-1, 24 hrs., 2400. Software, Windows, etc., Fremont. Free. [Exp. #106.]

FrEdMail Slnidro. (510)895-1785. 1200/2400/9600. Edu-

cator/student network with Internet mail access, San Leandro HS, NorCal Hub. [Exp. #106.]

Friendly BBS. (510)432-7802. 300/1200/2400/9600. Upload/Download. Sysop: Doyle Goodman. [Exp. #106.]

The GIFT Shop BBS. (510)689-4986. Adult graphics: straight, gay, lesbian, bi, tv, bondage, S&M. Sysop: Waik Gan. [Exp. #106.]

GMV-BBS. (510)294-9052. 24 hrs., 300/1200/2400. Multiline subscription BBS. Teleconference, private chat, email, SIGs, games, and file library for Amiga, IBM, Apple 8-bit, and Mac. Livermore. [Exp. #105.]

Gold Diggers BBS. (510)568-7807. 24 hrs., 2400-19,200. Messages and files, mostly IBM. Registration. Fees \$10/yr. Sysop: Harry H. Goldberg. [Exp. #106.]

Grateful Med BBS. (510)689-0347. 8-N-1, 24 hrs., 1200/2400. Health professionals Fidonet/ADANet. Sysop: TC Dufresne. [Exp. #105.]

The HomeShopper Online. (510)687-3633. 8-N-1, 1200/2400/9600. Hardware, software, and services. Sysop: Max. [Exp. #106.]

IDCBBS. (510)865-7115, 814-8097. 8-N-1, 9600. Alameda, 340MB, 775+ confareas, Qmail 4.0, PCBoard, ILink, RIME BizNet. Sysop: Mike King. [Exp. #106.]

IISME-Net. (510)643-6258. 300/1200/2400/9600. Initiatives for Science & Math Education, Lawrence Hall of Science, K-12net educator/student network with Internet mail access. [Exp. #106.]

The Job Xchange. (510)521-5931. 2400-14,400, 24 hrs. Computer industry jobs, resumes. TechNet. Free. [Exp. #104.]

Kanon Tech BBS. (510)235-6839. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. Huge Cresource, echo mail, shareware. Commercial software/hardware well below retail. [Exp. #104.]

Knight Court BBS. (510)946-1049. 2400/9600/14,400. NFL, sports, gambling, chess, and 40+ doors. No charge, no hassle, no kidding. [Exp. #106.]

The Krypt BBS. (510)447-4623. 1200/2400/9600/14,400. Tons of multimedia and other subjects, GIFs, Win 3.x, MIDI, wav, SB/SBPro support. Sysop: Donovan Sobrero. [Exp. #104.]

LectrickBlue. (510)376-3805, 798-7705, 525-5332. 8-N-1, 1200/2400/9600/14,400. Internet, Usenet, WWIV-Net, WWIV-Link, VBBS-Net, Fido, Adult-Net, Icenet, 100+ msg bases, games, and more. [Exp. #106.]

Linkages International. (510)547-2162. 8-N-1, 24 hrs., 300/1200/2400. News, science and technology, African and African American culture. [Exp. #105.]

The MAD Board. (510)893-7410, 465-3219. 14,400. Online games, TW2002, EC, GWar, and The Pit. Free, 90 min./day. [Exp. #105.]

MDBJ. (510)658-8078. So blasphemous we can only use initials. NIRVANAnet. [Exp. #106.]

The Mines Of Moria. (510)559-9151. 1200. Role-playing games, msg bases, online games, TCHANSI Group. [Exp. #104.]

Mutant Valley BBS. (510)294-9052. 24 hrs., 300/1200/2400. Multiline information exchange. [Exp. #105.]

The New-Ark BBS. (510)796-0947. 24 hrs., 2400/9600. Tradewars, running on two CD-ROMs. Reg required. Sysop: Hiram Wolf. [Exp. #106.]

Night Creatures BBS. (510)481-9774. 24 hrs., 300/1200/2400/9600/14,400. Files, msg., online games, TrueType fonts. Beginners welcome. Free access. Sysop: [Exp. #106.]

NightLine BBS. (510)234-1053. Home of Vetlink #22, nationwide veterans info, supports echo conferences, over 30 veteran/military persons related conferences. Free. Sysop: Jon Mankowski. [Exp. #104.]

Off Broadway's AutoCAD BBS. (510)547-8801. 8-N-1, 300/1200/2400/9600. Dedicated to supporting AutoCAD. Message base free and non-members can download one file a day. Unlimited membership, \$50/yr. Sysop: Robert Schutz. [Exp. #106.]

Olde Stuff BBS. (510)530-3051. 8-N-1, 24 hrs., 2400. Antiques & collectibles. Buy, sell, learn. Sysop: Bill Clark. [Exp. #106.]

The Party Warehouse BBS. (510)256-9809 (1200/2400), 256-8979 (4800-38,400). 10 networks, UUCP, Internet, and more. Games and files, full access first call, over 150 message bases. [Exp. #106.]

Pittsburg Pirates BBS. (510)432-2927. 24 hrs., 300/1200/2400/9600. Running OMNI 128 and OMNI-Net, msg. bases, UL/DL areas. C64/128 board, but all welcome. Sysop: Slowhand. [Exp. #106.]

Preferred Capital BBS. (510)798-2668, 798-0775. 8-N-1, 1200/2400. Two lines, complete range of loan products—firsts, seconds, bad credit, etc. Sysop: Jesse Rice. [Exp. #106.]

Psychic Link BBS. (510)849-5939. 24 hrs., 2400. Share with others interested in psychic abilities and energy. Interna-

tional caller base. Shareware. [Exp. #106.]

Quasatron BBS. (510)846-6085. 24 hrs., 9600 V.32. IBM, electronics, two-way & amateur radio, games, adult files, etc. Telecom industry professionals welcome. Reg not required. Sysop: KC Mazie. [Exp. #104.]

Rat Head Systems. (510)524-3649. 2400. Virtual gutter for digital derelicts. Instant access. NIRVANAnet. No fee. [Exp. #105.]

Realitycheck. (510)527-1662. Moved to Albany. Instant access, no fee. NIRVANAnet. [Exp. #106.]

The Road Not Taken. (510)848-5248. Active message bases, friendly, non-technical atmosphere. [Exp. #105.]

Sir James BBS W/ Magick Resource Center. (510)261-6567. 300-14,400. Magick, Pagan, SCA Music, Adult, MIDI, Music, Soundblaster, Windows, games. Reg req., free. Sysop: Sir James. [Exp. #105.]

Terminal One BBS. (510)432-2461. Soundblaster files, aviation and other GIFs, animation files. Wildcat 3.51, WWIV 4.21a. [Exp. #106.]

Testing 1,2,3...BBS. (510)373-0873. 24 hrs., 1200/2400/9600. IBM/Mac, messages, shareware files, nine lines. Livermore. Sysop: Corey L. Nelson. [Exp. #104.]

Tiger Team. (510)658-0607. Games, data encryption, PC Security and virus prevention. Firearms conference. Free. [Exp. #104.]

Trafalgar BBS. (510)735-3230. Online games, files, email, easy access. Auto-validation. Sysop: Lord Nelson. [Exp. #105.]

The Transfer Station BBS. (510)837-4610, 837-5591. 8-N-1, 24 hrs., Free Internet/Usenet access. Lrg. DOS/Windows/OS2 library. No fees. [Exp. #106.]

ASSOCIATIONS

American Association For Artificial Intelligence (AAAI). Call: (415)328-3123. Email: membership@aaai.org. [Exp. #104.]

Association For Women In Computing. Meetings: 1st Wed., 5:30 pm, San Francisco. Call: (415)979-8450. [Exp. #107.]

The Association For Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #105.]

Vericomm BBS. (510)891-0303. 24 hrs. UFOs, conspiracies, occult, Phoenix liberator. [Exp. #105.]

Viper 1 Premium BBS. (510)535-0231, 535-0315. 8-N-1, 24 hrs., 2400/9600/19,200. Multiline, 900MB, 1.3GB online, large adult file areas, games, file scanning facilities online. [Exp. #104.]

WelchNet Pleasanton. (510)417-0444. 1200/2400/9600. Finance and investment-related files, msg. areas. No fee. Sysop: Mark J. Welch. [Exp. #106.]

WildatHeart. (510)689-WILD. 300/1200/2400. VirtualNet BBS, high access for first-time callers. The BBS with heart! Sysop: Steve Rochin. [Exp. #106.]

Windows Online. (510)736-8343. Over 6000 Win 3.x & 11,000 DPS files, 5GB, 13 lines using USR-DS modems. Free trial. [Exp. #106.]

Winshare BBS. (510)686-4464. 1200/2400/9600. Multinode, your new connection point for Windows shareware/support files. Running Wildcat! Free. [Exp. #106.]

Wishing Well BBS. (510)745-7901. 24 hrs., 300/1200/2400. Email, matchmaker, files, 100+ online games, adult sig/files. Free. [Exp. #106.]

World Conquest BBS. (510)689-4095. 24 hrs. Internationally known wargame, free trial game. Log game request w/sysop. Sysop: [Exp. #105.]

Worldview BBS. (510)676-2919. 8-N-1, 24 hrs. 1200-14,400. Reformed Christian perspective, files/discussion on philosophy, public policy. \$49/yr. Sysop: Bill Gram-Reefer. [Exp. #106.]

707

The Black Rose. (707)557-6444. 24 hrs., 300/1200/2400.

Commodore 64/128 BBS, running Image v1.2a and a NISSA Network Assoc. ANSI graphic menu, health msgs. Sysop: Captain Keelhaul. [Exp. #104.]

Dobbs Enterprises. (707)427-0277. 300/1200/2400/9600. Part of WIVInet conference, 24,000+ files. [Exp. #106.]

Mnemonic BBS. (707)451-8353. 300/1200/2400/9600/14,400. CD-ROM 7,000 files, netmail, doors. [Exp. #106.]

Recommended BBS. (707)448-2225. 24 hrs., 300/1200/2400. Multiuser games, teleconference, conversational and technical areas, 16 lines. All welcome. Sysop: Jay C. Parangalan. [Exp. #105.]

Sonoma Online. (707)545-0746. 60 echo-mail SIGs, UUCP email, 9K files, alt energy/home power magazine. User supported, free. [Exp. #104.]

Threat Management Institute BBS. (707)935-1713. 8-N-1, 24 hrs. Conferences dealing with issues of personal defense, firearms, law, etc. Schedule of TMI Classes. No Fees. Sysop: Peter Alan Kasler. [Exp. #105.]

UNIX Online. (707)792-0402, 795-1721. 24 hrs., Usenet access. For UNIX, Amiga, Mac, and DOS users. [Exp. #106.]

User Friendly BBS. (707)645-8894. 8-N-1, 24 hrs., 9600. IBM/Amiga, NCNet, MSINet, msgs, sci-fi/fantasy info and reviews, doors. Sysop: Jim K. [Exp. #106.]

Virtual Reality. (707)539-6944. 6 pm-8 am, 300/1200/2400. Message bases, games, Amiga support. Sysop: Bryan Magers. [Exp. #105.]

916

24th Street Exchange. (916)451-7179. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. 16 lines; 4 CD-ROMs, well-maintained. [Exp. #106.]

Association Of Database Developers (ADD). Meetings: 2nd Thurs., 7:00 pm, The Gatehouse, Fort Mason Center, San Francisco. Organization for professional xBASE language systems developers. Membership \$50/yr or \$5/meeting. Call: JoAnn, (415)863-6706. [Exp. #105.]

The Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thurs., 6:30 pm, Amdahl Corp., Sunnyvale. Call: Doug Jones, (408)737-5999. [Exp. #105.]

Computer Professionals For Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, Rm. 608-7. Call: Judy Stern, (510)643-7499. [Exp. #105.]

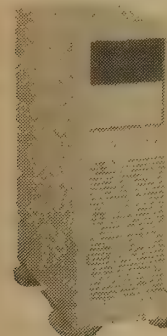
Data Processing Management Association. Call: (415)978-0868. [Exp. #105.]

IEEE Computer Society, San Francisco Chapter. Meetings: Varying Weds, 7:00 pm, SF State. Call: (415)905-4400. [Exp. #109.]

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ASSOCIATIONS

sultants Association, Northern California Chapter. Meetings are open to all. Only national trade assoc. comprising non-aligned working computer professionals with in-the-trenches experience. Call: ICCA, (415)441-2948. [Exp. #106.]

International Network Of Women In Technology. Dedicated to significantly increasing the leadership of Women in Technology in industry and government. Call: Dr. Carolyn Turybfill, (415)336-1007. Email: Carolyn.Turybfill@Eng.Sun.COM. [Exp. #105.]

North Bay Systems Professionals. Meetings: 3rd Wed., 7:00 pm, Holiday Inn, Terra Linda, 1010 Northgate Dr., San

Rafael. NBSP provides a forum and network for systems professionals. Call: Harry Chapman, (415)291-0174. [Exp. #109.]

Robotics Society Of America. Meetings: 2nd Mon., 8:00 pm, Exploratorium Library, San Francisco. Call: Brad Smallridge, (415)550-0588. [Exp. #106.]

Society For Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:00 pm, Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Call: Rich Julius, (415)837-0397. [Exp. #106.]

Society For Technical Communication, San Francisco

Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #107.]

Software Entrepreneurs' Forum. 3rd Wed., 6:30 pm, Elk's Lodge, 4249 El Camono, Palo Alto. Industry association dedicated to software developers and entrepreneurs, offering information and education on all facets of the software industry. Call: information, (415)854-7219; reservations, (415)965-9003. [Exp. #106.]

United Sysops Association. Meetings: 2nd Wed., 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Organization of bulletin board sysops and users. Call: Bill Strouse, (408)739-9081. BBS: (408)739-8753. [Exp. #105.]

USER GROUPS

7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #109.]

CAVE—Commodore Amiga Video Enthusiasts. Meetings: Every other Sat., 8:00 pm, 304 Springs St., Old Suisun. Call: Ron, (707)421-2283. [Exp. #105.]

CWEST Commodore 64/128. Meetings: 3rd. Mon., 7:00 pm, Conference Room, Laguna Honda School, 1350 7th Ave., San Francisco. Call: (415)626-9946. [Exp. #109.]

CONTACT MANAGEMENT

Bay Area TeleMagic User Group. Meetings: 2nd Wed., 4:00 pm. Call: George Workman, (408)476-6385. [Exp. #106.]

The Golden Gate Telemagic User Group. Meetings: 2nd Wed., 4:30 pm, Flood Bldg., Room 1213, 870 Market St., San Francisco. Call: 1-800-238-3370. [Exp. #109.]

CP/M

San Francisco Computer Society. Meetings: 7:00 pm, Laguna Honda School, 1350 7th Ave., San Francisco. Call: Ralph Gallagher, (415)929-0252. [Exp. #109.]

DESKTOP PUBLISHING

Bay Area Desktop Publishing User Group. Meetings: 1st Wed., 7:00 pm, Nisha Software, 2493 Telegraph Ave., Berkeley. Topics include editing and publishing as a career. Call: (510)848-8200. [Exp. #105.]

Golden Gate Computer Society DTP SIG. Meetings: 3rd Thurs., 7:00 pm, Conference Room, Bay Area Training facilities, 4340 Redwood Highway, Suite 138-F, San Rafael. Call: (415)485-1871. [Exp. #105.]

San Mateo County Ventura Publisher User Group. Meetings: 3rd Mon., 6:45 pm, San Mateo ROP, 1800 Rollins Rd., Rm. 14, Burlingame. Call: Elinor Cruze, (415)366-5317. [Exp. #106.]

FREEDOM, PRIVACY, AND TECHNOLOGY

BMUG SIG On Freedom, Privacy, And Technology. Meetings: Last Sun., 2:00 pm, BMUG office, 2055 Center St., Berkeley. Call: Judi Clark, (510)549-2684. [Exp. #104.]

IBM AND COMPATIBLES

Alameda Computer User Group. Meetings: 2nd Wed., 7:30 pm, Social Hall, Temple Israel, Island Dr. and Mecartney Rd. Providing an informal fo-

rum for both Macintosh and PC users to explore questions about hardware and software. Call: (510)523-1139. [Exp. #106.]

DVPC—Diablo Valley User Group. Meetings: 1st Thurs., 7:30 pm, Bank of America, Bldg. B, Clayton Rd. at Galindo, Walnut Creek. SIGs include WordPerfect, Windows, Paradox, Beginner's, Visual Basic, education/entertainment, and new users. Call: (510)943-1367. [Exp. #106.]

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Montclair. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627. [Exp. #105.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon. 6:45 pm, San Rafael Community Center. Free intro to computers class at 6:00 pm. Call: (415)927-2909. [Exp. #106.]

IBM Technical SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Peter Harris, (415)329-1880. [Exp. #106.]

Micromale-CP/M-DOS Users Group. Meetings: 1st Thurs., 7:30 pm, Eclectic computer buffs. Chabot Observatory, 4917 Mountain Blvd., Oakland. Call: Ed Miller, (510)376-1611. [Exp. #109.]

PC Basics: Silicon Valley Computer Society SIG. Meetings: 3rd Mon., 7:30 pm, 847 W. Maude Ave., Sunnyvale. Talks presented by Rich Wingerter of Zip Consulting & Design. Call: (415)326-2435. [Exp. #105.]

Peninsula Computer Club. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: Larry Welling, (415)593-9981. BBS: (415)571-9259. [Exp. #109.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm. For those who use computers in business. Visitors \$5. Call: (415)788-5338. [Exp. #109.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm, Conference Center, Bldg. A, Fort Mason. Visitors \$4. Call: (415)979-5879. [Exp. #109.]

South Bay WordPerfect User Group. Meetings: Dates vary, Saratoga Community Library. Free. Call: Martin Van Derpool, (408)238-8434. [Exp. #106.]

Stanford/Palo Alto PC User Group. Meetings: Last Wed., Turing Aud., Stanford. DOS/Windows. Call: (415)329-8252. [Exp. #105.]

KNOWLEDGEMAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdb products, esp. KnowledgeMan and Guru. Call: (510)947-4878. [Exp. #107.]

LANTASTIC

LANTastic User Group Of The East Bay. Meetings: 6:00 pm, 2770 Marin Blvd., Berkeley. Call: Loretta, (510)444-1441. [Exp. #109.]

LAPTOPS

HPX HP Laptops & Handhelds. Meetings: 2nd Sat., 10:30 am, Sunnyvale. Call: Michael Felsenstein, (415)564-8279. [Exp. #106.]

LEGAL

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed., noon, Brown bag meetings. SF Bar Assoc. Boardroom, 7th Fl., 685 Market St. Call: (415)421-5650. [Exp. #106.]

MACINTOSH

A32 Macintosh User Group. Meetings: 2nd Sat., 10:00 am, GTE Bldg 3 Cafeteria, 100 Ferguson Dr., Mountain View. Call: (408)263-0398. [Exp. #109.]

BMUG West. Meetings: Last Mon., 6:30 pm, San Francisco Exploratorium. Call: (510)549-BMUG. [Exp. #105.]

BMUG—Berkeley Macintosh User Group. Meetings: Every Thurs., 6:00 pm, Physical Sciences Lecture Hall, UC Berkeley Campus. Call: (510)549-BMUG. [Exp. #105.]

Diablo Valley Macintosh User Group (DVMUG). Meetings: 3rd Tues., 7:00 pm, St. Mark's Lutheran Church, 3051 Putnam Blvd., Pleasant Hill. Meet Mac users, learn about our SIGs. Call: (510)939-2141. [Exp. #106.]

International Macintosh User Group (IMUG). Meetings: 3rd Thurs., 6:45 pm, location varies. A forum for multilingual computing. Call: Roger Sherman, (415)859-5146. [Exp. #109.]

Let's Go Macintosh Computer Society. Meetings: 3rd Thurs., 7:00 pm, Skyline Jr. College, Media Center, Rm. 2105, San Bruno. See and try interesting new products, meet other Mac users, hear guest speakers. Call: Fidel Cajulao, (415)221-2995, or Nolan Apostle, (510)947-2523. [Exp. #108.]

Macintosh SIG Of Programming And Interfacing Enthusiasts. Meetings: 2nd Thurs., Lynbrook High School, Rm. 33. Call: George Ingalls, (408)243-0234. Write: PO Box 2185, Santa Clara, CA 95055. [Exp. #105.]

USER GROUPS

ACCOUNTMATE

AccountMate User Group. Meetings: 3rd Tues., 7:00 pm, S. Branch Berkeley Library, 1901 Russell St. Call: Joshua, 1-800-310-0262. [Exp. #104.]

ACCOUNTING SOFTWARE

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wednesdays. Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #104.]

ADOBE

Systems Adobe Technology Exchange: San Francisco Peninsula/South Bay Chapter. Meetings: 2nd Wed., 7:00 pm, M&T Publishing, 411 Borel Ave., San Mateo. Call: ATX, (408)562-6104. [Exp. #109.]

AMIGA

3rd Dimension—Imagine/Lightwave User Group. Meetings: 1st & 3rd Mon., Computer Showcase, 2739 Geary Blvd., SF. Call: Ollie, (415)863-8792. [Exp. #106.]

AAA—Amiga Addicts Anonymous. Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, monthly disks, info line. Call: (510)935-0829. [Exp. #109.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (510)829-6053. [Exp. #109.]

Amiga User Group—Germany. German Amiga user group is seeking contacts in the US. Contact: Nils Wietelmann, Unter den Heestern 28, W-2839 Kirchdorf, Germany. [Exp. #105.]

#106.]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:30 pm, College of Marin Science Center, Rm. 190. Beginners class at 6:00 pm. Call: (415)456-1411. BBS: (415)485-5895. [Exp. #109.]

AWEST Amiga Users In SF. Meetings: 1st Thurs., 7:00 pm, Laguna Honda School, Conference Rm., 1350 7th Ave., San Francisco. Call: (415)584-8406. [Exp. #109.]

FAUG—First Amiga User Group. Meetings: 1st Tues., 7:30 pm, HT Electronics, 275 N. Matilda Ave., Sunnyvale. Q & A, new product demos, public domain software. Call: Mike Fisher, (415)855-9426; BBS: (415)595-2479; Usenet: mike@hpspd.hp.com. [Exp. #106.]

Redwood Empire Amiga. Meetings: 3rd Tues., 7:30 pm, Santa Rosa Plaza, Community Room. SIGs meet throughout month. Call: (707)523-9978. BBS: (707)795-2717. [Exp. #109.]

TOGA—The Other Group Of Amigoids. Meetings: Varying Sat., 12:30 pm, Milpitas Library, 40 N. Milpitas Blvd. Call: Lawrence Brown, (408)984-6036. [Exp. #104.]

APPLE

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Call: Roger Laker, (415)367-8657. [Exp. #109.]

Tri-Valley Apple II User Group. Meetings: 1st Wed., 7:00 pm, Glendale Federal Bank, 3101 Crow Canyon Place, San Ramon. Come and learn more about your computer. Support II+, IIc, IIe, IIGs. Call: (510)828-0959. [Exp. #105.]

AT&T

AT&T Computer User Group,

North Bay. Meetings: 1st Wed., general discussion at 6:00 pm, meeting begins at 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. MS-DOS and UNIX. Call: Jim Lansing, (415)885-6631 or Joe Mahoney, (415)584-6510; BBS: (415)829-6027. [Exp. #106.]

AT&T Computer User Group, South Bay. Meetings: 3rd Wed., general discussion at 6:30 pm, meeting begins at 7:00 pm, location varies. MS-DOS. Call: Barbara Kievlan, (408)371-0215. [Exp. #106.]

AT&T UNIX Computer User Group, South Bay. Meetings: 4th Wed., program begins at 7:00 pm, location varies. Call: Thad Floryan, (408)985-7100; U S E N E T, thad@cup.portal.com. [Exp. #106.]

ATARI

BAAUG (Bay Area Atari Users Group). Meetings: 1st Mon., 7:00 pm, Agnews Aud., Santa Clara. Call: Andres Barbiero, (408)983-9787. BBS: (408)986-0215. [Exp. #107.]

DACE—Diablo Atari Computer Enthusiasts. Meetings: 1st Thurs., Contra Costa Water District Bldg., 1331 Concord Ave., Concord. Call: Dan Galant, (510)689-8256. [Exp. #109.]

BASIC

SF Bay Area Visual BASIC User Group. Call: Gustavo Eydelteyn, (510)547-7295. [Exp. #104.]

CAD/CAM

SF Bay Area AutoCAD/DCA Software User Group. Meetings: 3rd Wed., 6:30 pm. All CAD users welcome. Call: Michael Foley, (510)734-0707. [Exp. #105.]

COMMODORE

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs.,

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Do you have a plug-in ISA Bus CPU Card you need a home for? Try this eight-slot AT Backplane for size! Measures only 7.5" x 8.5" to fit in many custom enclosures. It has a standard IBM-type keyboard connector (5-pin DIN) and the standard power supply connection, so any IBM or Clone type power supply will work. The high-quality Dutch-made motherboard is of multilayer construction with internal ground plane. Fully assembled with eight edge connectors. Hurry, when word gets out, these won't last long! HSC# 13643 \$29.95

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This tiny (only 1" x 1.75" x .5") PC mount package is a varactor tuned FM tuner! Made by Toko (Model #TMC103A) Uses 8-12VDC, tunes from 88.3 to 108.1 MHz from 75 ohm antenna input, has 10.7 MHz IF output with Vco output for control feedback to tuning circuitry. We provide a schematic of a suggested application showing pinout of this module with related tuning circuit. HSC# 13101 \$4.95 ea. or 10/\$39.95

Still available, but for how long?

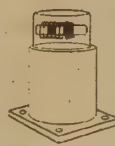


It usually doesn't take long to sell out of these popular batteries when we get a batch in, so stock up now! These Yuasa NP7-12 rechargeable lead-acid batteries are rated at 12VDC, 7 amp/hours. Perfect for hobbyists, Ham field-days, burglar alarms, etc. New from the crate, '91 date codes. 2.5" x 4" x 6" with solderless quick-connect tabs. HSC# 13123 \$14.95 ea.

TV Modulator -- Industrial Strength!

Just what you needed to finish that home television station...this Channel 2 modulator by Telemet! These used units accept a composite video signal and audio and provide a VHF television carrier (channel 2) modulated by the input signal. 19" Rack mount chassis, schematic included. Full Manual available, \$5 HSC#13657 \$59.95

Test for Shock -- Industrial Strength!



Here is an unusual item...a resettable G-force gauge! This high quality item is used to detect mechanical shocks in excess of 15 G's...perfect for determining if your shipment was dropped by the shipping company, or use to calibrate your rocket sled! Measures 2" tall on a 1 5/8" square base. Detailed data sheet enclosed. HSC# 13656 \$5.95

Torque Wrench -- Industrial Strength!

Just in -- industrial torque wrenches by Mountz. These brand new items are calibrated from 20 to 200 kgf. cm and feature "click" action torque control. Snap-fit heads include useful 3/8" drive ratchet, 11/16", 30 mm and 13mm open ends, and 17mm box end. HSC#13655 Set only, \$19.95

Macintosh Serial Cable Set

Three piece set of Mac accessory cables consists of one RJ11 to DB9S cable, one RJ11 to Mini-DIN 8M cable, and one DB9M to DB25F adaptor. Sorry, we don't know what accessories they were intended for, but they appear to be plain, standard cables, and at this price you can afford to stock up and experiment. Both cables are six feet long, are fully shielded and have noise suppressor chokes, and all three items are an attractive off-white color. Large quantity purchase means a special low price! HSC#13048 \$4.95 ea. or 10/\$39.95

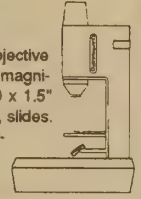
Soviet Microscope... ...Standard Version

They call them training microscopes, we would call them student-grade instruments (but not toys!) They are biological (illuminated from below via mirror) microscopes with two objective lenses (8x, 20x) and three eyepieces (7x, 10x, 15x). Optical quality and workmanship are surprisingly good. Painted cast aluminum, and chrome-plated brass. HSC# 13065 New batch, now only \$59.00



Soviet Microscope... ...Economy Version

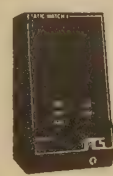
Perfect for child's first microscope! Fixed objective lens and eyepiece (can't get lost!) 60X overall magnification, folds into its own carry-case, 5 x 9 x 1.5" Comes with tweezers, probe, specimen jars, slides. Plastic construction means light weight, perfect for field use. Surprisingly good optics! Perestroika produces another great value! HSC# 95062 \$19.95



Last Chance! The Electronic "Leash" and Static "Watchdog"



HSC is still able to offer you two alarms that protect you in unusual ways...but not for long! The first is the "Sensor Alert" seen at left. This is a pair of small units that are "tuned" to each other and like to be near one another! When separated by more than 15 to 30 feet, the receiver emits a beeping tone. Think of the uses! Put the transmitter on your small toddler at the shopping center, keep the receiver on your belt (both units have clips). If Junior wanders off...BEEP! Or put one on your car keys, you will never leave the room without them! The possibilities are endless. The receiver is only 2" x 2.75" x .5", and the transmitter is even smaller, only 1.5" x 2.25". Each unit uses three button cells (included). HSC #13024 only \$6.95 for the set. The other alarm is our Static Charge Alarm, seen at right, which will alert you to the presence of static electricity fields in its vicinity. This is important to know when working with CMOS or other sensitive integrated circuits. The unit beeps when one of three levels of static charge is detected, allowing you to take preventive action. Only 4" tall, uses a 9VDC 300mA adaptor (included) or a 9V battery (not included). Prevent shocking developments! HSC #12846 only \$4.95



Dot-Matrix Printers at Diminutive Prices!

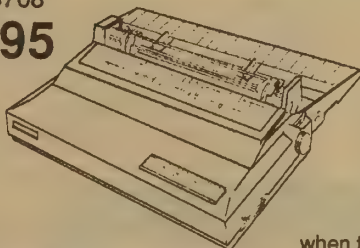
Don't wait! This is a one-time opportunity to buy a name-brand printer at no-name prices! Use as a back-up to your main printer, or as a quick draft or invoice printer, the uses are endless! These are factory refurbished units that look like new, and have been repackaged with manuals, power cord, paper supports, etc. We offer a ninety-day warranty on these units.

Citizen MSP-40 9-pin printer --

- features:
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Also available
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More from HSC's Project Locker...

We've scoured our shelves once again for rare & unusual parts that will get you thinking of the many uses to which they may be put. Many items you just won't find anywhere else, and our prices will encourage you to dream up new projects!

A. Macintosh peripheral device adaptor converts older Mac 128 & 512 style peripherals (9-pin D conn.) to the Mac Plus and higher Mini-DIN connector. Requires 15-17 VAC input (use HSC# 12916 16VAC adaptor, \$3.95 and HSC#206B 3mm plug, \$.59) HSC#13001 \$5.95



B. Heatsink with complementary Darlington Pair transistors measures 3" x 6.25" x 1", has 2N6031 (NPN) and 2N6058 (PNP) already mounted. 80V, 12A, hFE = 750 to 18000 @ 6A. HSC#9677 \$5.95



C. Microswitch 103SR11A-1 Proximity Sensor -- Hall-effect detector operates on 5 VDC 4 mA, sources 3.5 VDC max 20mA in presence of greater than 25 Gauss magnetic field. .43" dia. x 1" (nuts not included) With spec. sheet. HSC #5319 \$.99 ea



D. Tiny switching power supply, perfect for powering a single 3.5" hard disk drive. 2" x 6.25" x 1.25". Made by Skynet, used, tested good. Selectable 110/220VAC input, 5VDC @ 2A and 12VDC @ 1.5A output. HSC #12758 \$17.50 ea



E. Nine-digit, eight decimal point numeric LCD with solderable connection strip. No funny sockets needed! .5" high digits, overall size of display .75" x 3". Pinout included. HSC#13518 \$1.95 ea. or 10/\$15.00



F. Miniature Toggle Switch -- SPDT 125VAC 6A or 250VAC 3A Standard type on-on switch, solder eyelet terminals. Any hobbyist should have at least a handful in his parts bin! Now you can afford it!... HSC# SW104 10/\$6.95



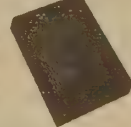
G. High Value Capacitor -- .047 Farad (yes, that's Farad) at 5.5V in a package only .5" dia. and .3" tall. Good for CMOS memory back-up, etc. Made by Sohio. HSC# 10771 \$.29 ea. or 10/\$2.49



H. Leviton 6608 touch-activated dimmer control -- Make any metal surface or contact dim an incandescent lamp (up to 150W) simply by touching it! UL Recognized 120VAC dimmer module has three connections: line, load and touch contact. Think of the applications! 1.5" x 1.5" x 2.75" HSC# 13037 \$5.95 ea



I. Pager Project -- Ever wondered how a pager works? Take one apart and find out! Operates on a 100.3 MHz FM subcarrier. Uses NiCd's, measures 2.5" x 4" x 1". Made by SPANtel, Model 1004. No display, no docs, but we think they either beep or have voice annunciation. You tell us how they work! HSC# 13511 \$6.95 ea



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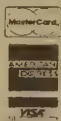
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USER GROUPS

#105.]

Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Cafeteria, City Center 4, De Anza and Rodrigues, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)999-2524. [Exp. #104.]

MacCruzers. Meetings: 2nd Wed., Santa Cruz. Call: Peter Visel, (408)454-0403. [Exp. #109.]

Macs Of Marin. Meetings: 2nd Thurs., 7:00 pm, Redwood High School, Larkspur. Marin County Mac User Group for all levels of expertise, beginners welcome, SIGs. [Exp. #107.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Call: Roger Lakef, (415)367-8657. [Exp. #109.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. Call: Dean Fearn, (510)881-9160. [Exp. #109.]

MULTIMEDIA

BMUG Multimedia SIG. Meetings: 2nd Mon., 6:00 pm, Call: (510)549-BMUG. [Exp. #106.]

International Interactive Communications Society—IICS. Meetings: 2nd Tues., 7:00 pm, alternate locations San Francisco and south bay. For people involved or interested in developing and using interactive multimedia technologies. Call: IICS Hotline, (415)328-7318. [Exp. #106.]

Macromedia User Forum. Meetings: 1st Wed., 600 Townsend, at 7th St., San Francisco. Meet fellow professionals, preview products, get questions answered. Call: John Dowdell, (415)665-3916 (days); Email: jdowdell@aol.com. [Exp. #106.]

Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Palo Alto, Rm. H-1. SIG of Software Entrepreneurs' Forum. Call: Valerie Taylor, (415)424-9051. [Exp. #109.]

Multimedia User Group. Meetings: 1st Wed., 7:00 pm, 600 Townsend St., 1st Fl., San Fran-

cisco. A forum to learn about the multimedia industry, get your questions answered, and meet with fellow professionals. Sponsored in part by Proxima and Mitsubishi. [Exp. #106.]

North Bay Multimedia Association (NBMA). Meetings: 3rd Thurs., 7:00 pm, alternated locations. Call: Luong Tom, (415)459-0441. AOL:NBMA. [Exp. #109.]

NETWORKING

NetsIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)277-5867. [Exp. #105.]

NEXT

BANG—Bay Area Next Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. Call: (415)327-BANG. Email: info@BANG.org. [Exp. #109.]

Berkeley Next Users Group. Meetings: 2nd Tues., 7:00 pm, 2055 Center St., Berkeley. Call: Bernt Wahl, (510)644-0139. [Exp. #105.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)739-9081. BBS: (408)739-8753. [Exp. #106.]

OMNIS 7

GUIdata Bay Area Omnis 7 User Group. Meetings: 1st Mon. Newsletter, forum for all users. Call: Peter Bennett, (510)935-5203. [Exp. #107.]

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm. For anyone interested in OS/2. Presentations, product demos, questions and answers. Call: (415)755-3124. [Exp. #109.]

OS/2 SIG Of San Francisco. Meetings: 2nd Wed., 7:00 pm, location varies. Call: Margery Blum, (415)931-3110. [Exp. #106.]

PEN COMPUTING

Pen Systems SIG. Meetings:

4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Addresses all issues of interest for developers of pen computing software. Call: Bill McAplene, (415)348-2257 or SEF at (415)854-7219. [Exp. #105.]

PROGRAMMING LANGUAGES

C/C++ Programmers Network. Write: Rick Rowe, 3245 S. White Rd., Suite 106, San Jose, CA 95148-4056. Email: rown@netcom.com. [Exp. #109.]

Forth Interest Group Of North Bay. Meetings: 2nd Sat., 1:00 pm, 2055 Center St., Berkeley. Call: Leonard Morgenstern, (510)376-5241. [Exp. #109.]

Sacramento Forth Interest Group. Meetings: 4th Wed., 7:00 pm, SMUD, 1708 59th St., Rm. A, Sacramento. Call: Bob Nash, (916)487-2044. [Exp. #109.]

Silicon Valley Forth Interest Group. Meetings: 4th Sat., 10:00 am, Applied Biosystems, Inc., Conference Room A/B, 230 Lincoln Centre Dr., Foster City. Call: Art Hampton, (415)873-8554. [Exp. #109.]

PROJECT MANAGEMENT

Microsoft Project User Group. Meetings: 3rd Mon., 6:30 pm, TEK/LINK Corp., 2901 Tasman Dr., Suite 207, Santa Clara. Project management solutions with Microsoft Project software—both PC and Mac. Call: Henry Viveiros, (408)293-5201. [Exp. #105.]

Q&A

East Bay Q&A User Group. Meetings: 4th Tues., 7:00 pm, San Leandro. Developing and expanding the many uses of Q&A database/word processor program by Symantec. Call: Philip Edwards, (510)635-1997. [Exp. #106.]

West Bay Q&A User Group. Meetings: 2nd Tues., 7:00 pm, Redwood City. Developing and expanding the many uses of Q&A database/word processor program by Symantec. Call: Philip Edwards, (510)635-

1997. [Exp. #106.]

SQL

SQL-Forum/Bay Area SQL Database Server User Group. Meetings: Once a month in downtown SF. Oracle, SQL Server, SQLBase, and more. Call: Robert Gentry, DBBS, Inc. (415)583-3000. [Exp. #107.]

TELECOMMUNICATIONS

BMUG Telecom SIG. Meetings: Last Wed., 8:00 pm. How to use your modem, terminal programs, and the BMUG BBS. Call: (510)549-BMUG. [Exp. #105.]

TEXAS INSTRUMENTS

Santa Clara Valley TIPSC Group. Meetings: 4th Thurs., 7:00 pm, Magnolia Inn, 176 S. Bernardo, Sunnyvale. Newsletter, library. Call: Ralph, (510)526-2492. [Exp. #106.]

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #109.]

THEOS

Theos User Group. Call: (510)785-7355. [Exp. #106.]

UNIX/XENIX

N. Cal UNIX Users. UNIX user group now forming: AT&T UNIX, Coherent, SCO UNIX/XENIX, and LINUX. Write: Just Computers, PO Box 355, Cotati, CA 94931. [Exp. #105.]

UNIX SIG. Meetings: 2nd Tues., DEC, 800 W. El Camino Real, Mountain View. Sponsored by Software Entrepreneurs' Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #106.]

VIDEO TOASTER

Video Toaster User Group. Meetings: Last Thurs., 7:30 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, plus info/tips on new System 2.0. \$4 for non-members. Call: Andrew Timmins, (408)243-9233 (eve). [Exp. #108.]

WINDOWS

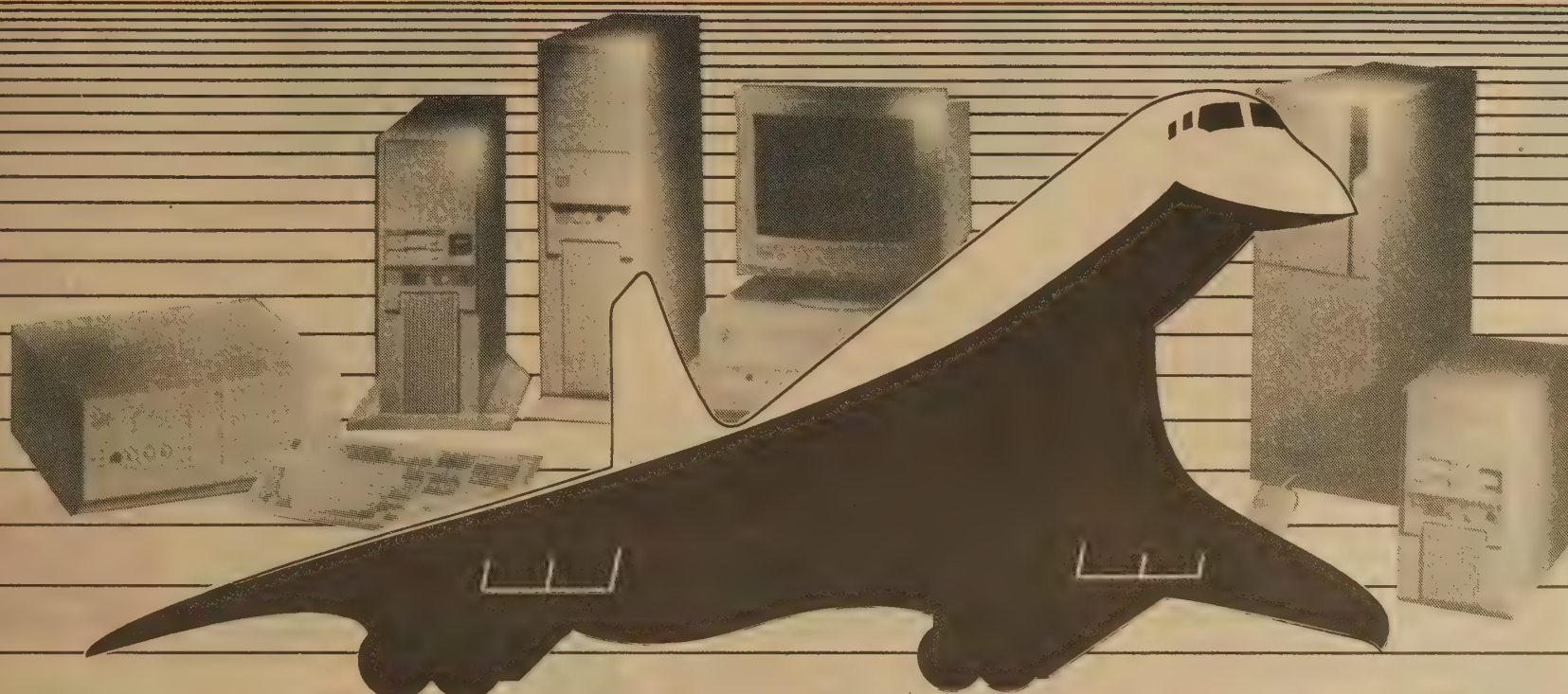
BMUG Windows Programmers SIG. Meetings: 1st Tues., 6:30 pm, 2055 Center St., Berkeley. The Programmers SIG is a forum for Windows programmers of all levels to meet and exchange information. Call: Ferdinand Rios, (510)526-3031. [Exp. #109.]

WinSIG. Meetings: 1st Wed., 6:30 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. Windows SIG of the Software Entrepreneurs' Forum. Call: Fran Finnegan, (415)288-4400. [Exp. #105.]

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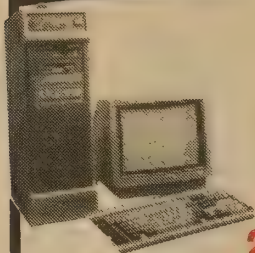
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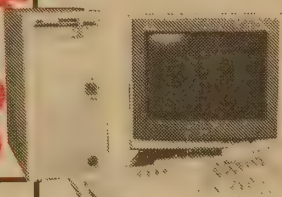
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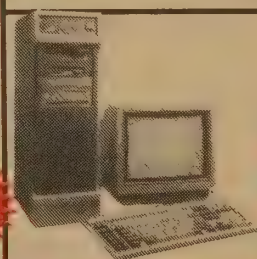
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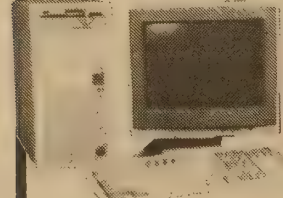
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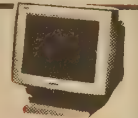
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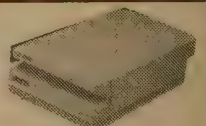
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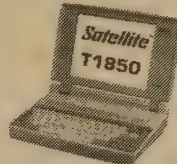
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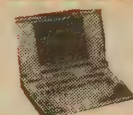
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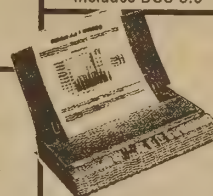


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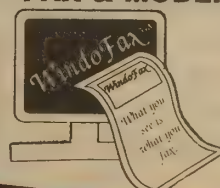


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Continued from page 43

Yes, we had recorders, but they weren't turned on.

"Look I just want everyone to be happy, buy stuff, that's all," Davis said. "You can quote me on that."

Fine, I said, but I'd have to have a name to quote. "You don't need my name," Davis said.

"OK, but I didn't catch your title, what's your job?"

"I work for one of the stores here."

"Which one?"

"None of your business. I don't have to tell you that."

A few more minutes of conversation revealed nothing more. I asked Davis if he knew any more about what happened when the kids were detained.

"I'm shocked such a thing would happen! I don't know anything about it," he said.

"Then you don't approve of such actions taking place?" I asked.

"Certainly not, I don't support anybody's rights being violated," Davis said.

I asked him his name again, and this time he said: "Santa Claus, as far as you're concerned."

I pressed him some more about what relationship he had to the mall and he told me: "I'm responsible for making sure the food court is clean and that everyone has a good safe time."

"Oh, so you're in management then... I thought you said you worked for a store?" I said.

At that point he refused to talk to me. "Just stop. Stop it now. I'm through answering questions. You're harassing me. Leave me alone."

It was at this juncture that Mr. Beefy Security Guard told me to leave

or I'd be taken in for trespassing. "Why?" I asked.

"A shopper has complained about you and I'm telling you to leave," he replied.

"But that guy [Davis] isn't a shopper!" I said. But the security guard wouldn't listen and immediately called for the uniformed Arlington Police who were already in the mall.

"What are you going to do, arrest me?" I asked the security guard.

"No, he won't, but I will," said the Arlington Officer.

And I left.

STILL NO WORD

The management of the Pentagon City Mall has refused to return another dozen phone calls. They've also refused to answer a detailed letter regarding both incidents.

The Secret Service hasn't been any more forthcoming. One mildly amusing story making the rounds among sources I have inside the FBI is that this bungled November 6th operation has given the Bureau a lot of joke fodder at the Secret Service's expense.

The FBI insists they weren't there... that night. And I believe them. They didn't issue the "non-denial denial" refusing to "confirm or deny." The FBI agent I spoke to flatly denied any presence at the mall that night. "Good thing, too, from the sound of it," he said.

Unfortunately the story isn't over. There are too many questions left unanswered. The surveillance of the 2600 meetings continues. I guess now that the Cold War is over these guys have to do something with all that extra time. ■

CREATIVE TOOLS

Continued from page 222

agers paying too much attention to the silicon, rather than the asphalt, will focus public outrage to these new technologies.

This year the Macintosh will make inroads into specialized markets. The computing needs of the baby and toddler community will be assisted with the Jello-brand touch-bowl controller. A young user's tiny hand is inserted in the bowl and this controls the cursor on the screen. The milk, water, and soy-proof mouse button sits at the bottom of the bowl for easy access. Regulation keyboards are much too complicated for the diaper crowd, and can be damaged by leaky bottles, runny noses, and "accidents."

Active computer users will not be over-

looked. The skateboard mouse will really get PowerBooks moving. The devices will require clearance by both the Federal Communications and Transportation Safety Commissions. Cruiseship recreation departments will get good use out of MacLimbo, a real-time sensor system for limbo sticks.

While reviewing last year's figures, Apple executives will discover that their best-selling and highest-return-on-investment products were Apple-logo clothing and accessories. This will lead John Sculley to declare that "Apple will become a consumer electronics and soft-wear company." Apple will purchase the ailing Gap clothing store chain, renaming them the Apple Republic stores. This will lead to a court fight over the rights to the "Republic" name between the Cupertino electronic manufacturer and the Banana Republic chain. Apple will lose in court again.

Microsoft will come out with a program which will not be updated annually! Instead, it will use Publish & Subscribe to be constantly updated—and will automatically bill your VISA credit card for it.

With the technology changing so fast, I predict that memory will be so cheap and storage so compact that standard Macs will have 128 MB of RAM memory and 5 GB of storage. This, coincidentally, will be the *minimum* memory requirement for Microsoft Word 6.0.

AVI RAPPOPORT, BMUG'S BIBLIOGRAPHIC GURU AND FORMER BOARD MEMBER

Expect 1993 to be a jumble of confusion with few dominant themes. There will be a lot of color and imaging on the high end, exotic QuickTime movie-editing programs and CD-ROMs. I suspect that low-priced simple programs may make a lot of money, if the magazines and dealers give them some space.

Warning: Under no circumstances should these predictions be used to influence any personal or business purchasing decisions! If you do, don't blame me or BMUG—we told you so. ■

Upcoming Events:

January 7	BMUG's Macworld Expo Party at The EndUp (6th Street and Harrison) in San Francisco.
January 14	To Be Announced.
January 18	BMUG South at United Way Building in San Jose.. To Be Announced.
January 21	To Be Announced.
January 25	BMUG West at Exploratorium museum in San Francisco. Brøderbund, Living Books and new games; Quark, Quark XPress 3.2.

MITCH TURITZ, BMUG WEST MEMBER AND LIBRARIAN

I predict that Apple will announce a disposable PowerBook computer. You will use it until the battery expires, then throw it away. A new and improved version will be available by that time.

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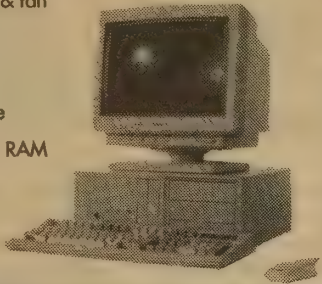
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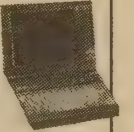
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Continued from page 64

it allocates and releases system resources, such as memory and interrupts, for PC Cards as their insertion and removal are detected by Socket Services. Card Services also provides the interface necessary to load hardware drivers.

Intel has also provided some silicon glue to ease the implementation of PCMCIA on PC motherboards. Its ExCA (Exchangeable Card

Architecture) has been adopted by twenty-nine mobile-computer vendors and all major BIOS vendors. ExCA allows the vendor of Intel-architecture systems to implement a standard socket. Chips based on the open standard developed by Intel are available from both Intel (the 82365SL ExCA chip) and Cirrus. "By Q1 next year the standard socket issue should be resolved," says Kirby Dyess,

mobile business unit manager for Intel's PCED Business Communications Division.

Frankly, I think that the only thing that may delay this evolution from reaching the desktop for as long as two years is Catch-22. Retailers must, regrettably, await the availability of many PC Card add-on choices before PCMCIA computers will sell in the volume required by their channel. So, the process will involve a couple of stages.

First, the choices available at this year's COMDEX will promote development of PCMCIA add-on subsystems for desktop computers (similar to the one in the third-party

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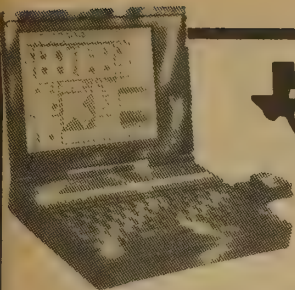
A PCMCIA system with its smaller power supply, hard drive, CD-ROM, and floppy should have a footprint about the size of a shoe box.

PowerBook docking station I mentioned last month). They will sit on the desktop, and plug into an ISA adapter or parallel port. This will give more vendors the incentive to hurdle the barrier of PCMCIA's technical demands.

In stage two, PCMCIA desktop machines will begin to appear, probably from the makers of small network workstations who will view it as an opportunity to add strength without bulking up. Eventually, the majority of desktop machines could make the transition.

Take this logic a small step further, and PCMCIA 2.01, Sockets Services, and Card Services spell the beginning of the end for the ISA bus. But PCMCIA has potential for more than replacing ISA. Under consideration are strategies for a 32-bit bus with bus mastering. It's potentially everything that EISA or MicroChannel offers, but in a package that will meet the needs of the smallest workstation.

Come to think of it, an array of PCMCIA card slots could just as easily define a sophisticated server. ■



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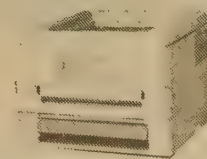
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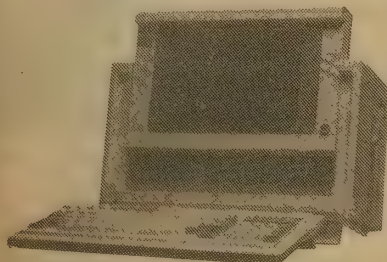
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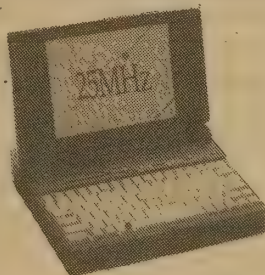
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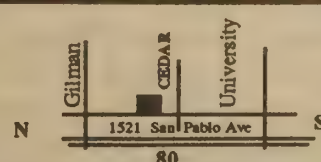
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Chris Peterson of the popular nanotechnology book *Unbounding the Future*-cofounded AMIX in 1986 to develop an emerging and previously neglected opportunity—allowing buyers and sellers to network and exchange digital goods (books, articles, and other content) and services (programming, consulting, etc.) online. AMIX's path to becoming "the only online service that sends you a check at the end of the month" has been strewn with obstacles, most recently its divestment from former parent Autodesk, but PC users are already online exchanging everything from science fiction to Smalltalk code. With the arrival of the long-awaited Macintosh version in 1993, an expanding user base is expected to broaden AMIX's scope of customer offerings considerably.

Ron Posner

President and CEO

WordStar International

What do you do with a company whose chief asset, a once-proud word processor, has irrevocably lost its position as an industry standard?

Posner, arriving at WordStar a few years ago with the mandate to save it from impending catastrophe, has restored it to prosperity with an approach that's a microcosm of a significant change in the industry itself. Instead of committing the company's resources to a losing battle for corporate market share, he decided to focus on the emerging consumer market and mass sales channels.

The effort has paid off handsomely—the company has a broad range of consumer software that's doing quite well, and a genuine hit with the American Heritage Dictionary, which not only enjoys good standalone sales but is a key component in bundling deals with both Apple and IBM.

Further taking advantage of emerging markets, Posner also recently entered into a merger with ZSoft, producer of PC Paintbrush, PhotoFinish, and UltraFAX. The latter is expected to be particularly significant in the company's future, representing a leading entry in the fax/OCR market.

Jerry Pournelle

Columnist

Pournelle's *BYTE* column is one of the longest-established information resources for the computer user, beginner and expert. Pournelle is definitely opinionated, but also endowed with a strong commitment to finding the truly useful products and passing the word along to his readers. As a result he continues to inform and entertain his faithful readership and acquire new fans every month.



Safi Qureshey

President and CEO

AST Research

While there was certainly a shakeout in the PC-compatible industry in 1992, AST had another year of record sales. And while some speculated that Qureshey would have problems running the company after the departure of cofounder Tom Yuen, he appears to be firmly



ly in control of his company's strategy.

And a diverse strategy it is, with AST building products from notebook computers to multi-486 parallel processing machines designed to run Windows NT in multiuser environments. While sticking to industry-standard platforms (Qureshey shuns RISC chips and sticks with the Intel standard), the company innovates in design and customer responsiveness, offering such unusual options as upgradable screens for notebook computers. In addition, the company does nearly half its business overseas and is a formidable global competitor.

Alex Razm'joo

President

Procom Technology

Iranian-born Razm'joo founded Procom in 1987 with three of his friends from UC Irvine and, despite hard times in the disk drive industry, has led the company to phenomenal growth, with sales of \$43 million in fiscal 1992 and projections of \$65 million for fiscal 1993, with a gross profit margin of 35%.

From its beginnings, capitalizing on the arrival of 3½" drives by marketing an external 5¼" unit, the company has invested heavily in R&D and come up with a number of innovations to enhance performance, ease of use, and reliability for its SCSI drives. It is especially strong in network storage and multimedia, and thereby well positioned to take advantage of these rapidly growing markets.

Jack Rickard

Editor

Boardwatch

As computer-based communications become an increasingly vital part of daily life, Rickard's magazine, which covers the BBS community, its people, products, and evolving issues, finds ever-wider audiences. Recently he's created a new resource for sysops and users—the annual BBSCON conference, which brings BBSers together from around the globe to discuss common problems and solutions.

John Roach

Chairman and CEO

Tandy

1992 was the year consumer electronics met the computer industry, and few companies were better positioned to take advantage of this than Tandy, with a host of new multimedia products and an expanding network of superstores featuring state-of-the-art merchandising techniques.

In August, Roach announced the creation of a new digital information format called the Video Information System, a CD-ROM based technology capable of utilizing both VGA and standard TV display technology. "This new format," said Roach, "enables us to create a unique product class that will provide a window to the world of digital information for the mass consumer."



Jerry Rogers

President and CEO

Cyrix

Rogers states the mission of the company, founded three years ago, as bringing about the "end of the microprocessor monopoly." And, while it's suc-

cessfully avoided some of the legal tribulations of AMD by not using Intel microcode in its chips, it also is involved in long-running patent hassles with Intel's lawyers. Rogers professes himself unworried by all this.

Meanwhile, in the few short months it's been shipping microprocessors, Cyrix has created a boon for cost-conscious, power-hungry hardware vendors and consumers alike, offering unmatched features like a 486-compatible chip that fits in a 386 socket.

As for Intel's decision to call its new product line "Pentium" because the name has been judged more legally protectable than its traditional 80x86 numbers, Rogers allows as how he'll be quite happy to call his future chips 586 and his customers will be happy to buy them.

Heidi Roizen

CEO

T/Maker

T/Maker has become a leader in the electronic content business, finding a lucrative market in distributing a full range of clip art products. During 1992, the company not only shipped its long-awaited new version of the WriteNow! word processor, it took advantage of the increasingly ubiquitous fax-modem to introduce FaxMania!, a wildly successful product that lets users send and customize a full range of eye-catching fax cover sheets.



Lance Rose

Jonathan Wallace

Authors

Syslaw

One of the few downsides to the phenomenal growth of the BBS community is the proliferation of legal pitfalls awaiting the unwary sysop, ranging from privacy to copyright law to viruses to obscenity ordinances. While many areas remain murky, this new edition of *Syslaw* is an indispensable resource for current and prospective BBS operators, illuminating the present and evolving state of the law in relevant areas.

Ben Rosen

Chairman

Eckhard Pfeiffer

President and CEO

Compaq Computer

With Compaq losing profits and market share to competitors like Dell in 1991, Rosen ousted cofounder and CEO Rod Canion and instituted a drastic change in the company's direction.

In 1992 Rosen and Pfeiffer have dramatically reversed the company's downward trend, introducing a competitively priced line of low-cost clones, broadening distribution into such outlets as Circuit City and CompUSA, and introducing CompaqCare, an extensive support program including a one-year limited on-site warranty and toll-free technical support for all products.

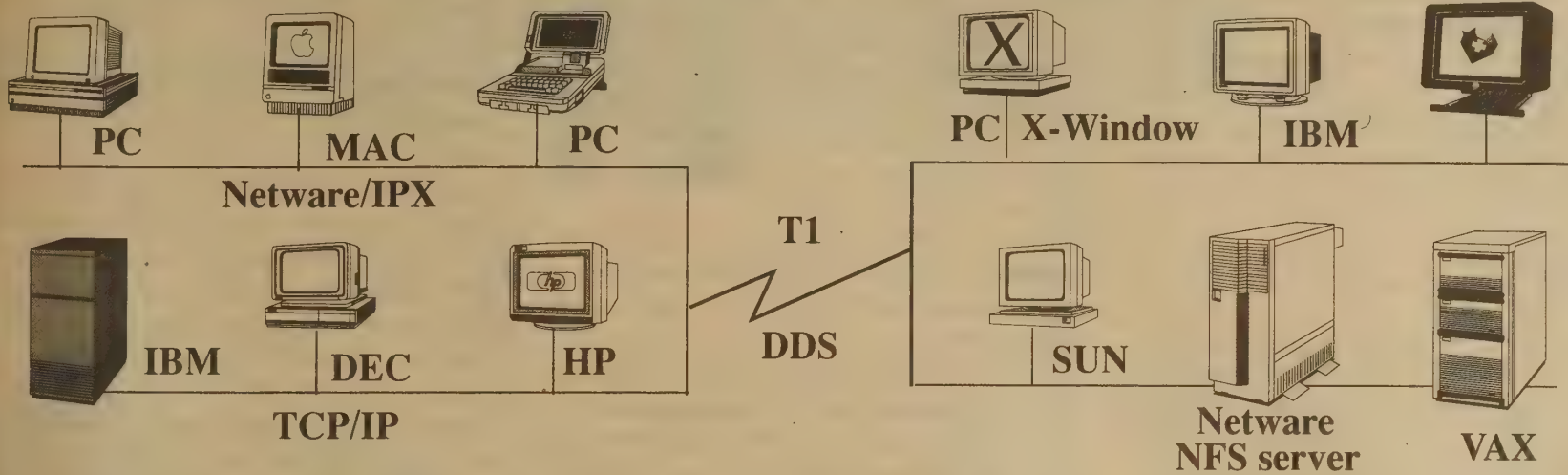
Alain Rossman

President and CEO

EO, Inc.

Earlier in his career, Rossman headed Apple's Macintosh software evangelism efforts and cofounded both Radius and C-Cube. His new company offers

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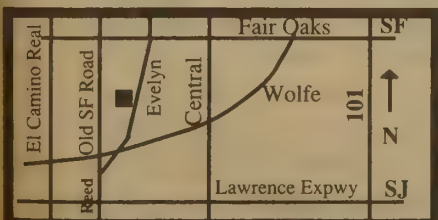
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what's perhaps the most interesting breakthrough product yet—the Personal Communicators, tablet-like communications devices that exchange files with PCs, send and receive faxes and email via cellular modem, run GO's PenPoint operating system, and support a full suite of robust pen-based applications. Derived from alliances with companies from AT&T (whose Hobbit chip is an integral part of the machine's architecture) to Sitka (whose PenTOPS handles its connectivity), the new machines are expected to open a wide range of options for mobile professionals and drive the development of many new ancillary markets.

Nicholas A. Samuel

Chairman and CEO

Insignia Solutions

Fortunately for Apple, Sun, and many others, there are many reasons for choosing non-DOS hardware. However, once customers have bought into the alternative platform, they often find themselves needing to run DOS or Windows applications. Enter Insignia, which has, since the first version of Soft-PC for Mac, enabled users to run the DOS software they often need on the hardware they love. With current versions for Mac, NeXT, and a variety of other workstation platforms, Insignia's software is a key component of increasingly common mixed computing environments.

Jerry Sanders

Chairman and CEO

Advanced Micro Devices

While the courts have dealt AMD a few recent setbacks in the 486 area, requiring it to develop its own microcode rather than use Intel's, Sanders has enjoyed some significant triumphs in the past year. Probably most significant is the increasing acceptance of the company's 386 chips among PC-compatible vendors, particular in the portable market where AMD's low power requirements constitute a significant advantage for the battery-dependent.

A side effect of AMD's success and an unmitigated boon to clone buyers is that it has forced Intel to become highly competitive in the pricing and features of its 80386 and 80486 product lines.

A further side effect is that Intel, stung by its competitors' legal ability to name its chips with the same numbers as their Intel counterparts, exerted considerable effort in picking a new, distinctive, and trademarkable name for its new CPU line, which will be called not 80586 but "Pentium." Judging by the initial response from the competition, there will be plenty of chips called 586 anyway...

Jack Schoof

President and CEO

Artisoft

Entrepreneur Schoof revolutionized the networking market with LANtastic, a peer-to-peer networking system which has become wildly popular due to its solid foothold in the dealer channel and its aggressive pricing. So well has LANtastic done that giant Novell felt compelled to go up against it with NetWare Lite, which has failed to make much of a dent in its sales.

Looming on the horizon, though, is Microsoft,

with Windows for Workgroups, which includes peer-to-peer networking as part of an integrated (and affordable) package. Time will tell, but Schoof has triumphed over formidable challenges before.

John Sculley

Chairman and CEO

Apple

When Sculley (with a BA in architectural design and an MBA) appointed himself Apple's chief technology officer in 1990, there was a fair amount of scorn and derision.

Very few people are laughing now, as the PowerBook line hit the \$1 billion mark even before the introduction of new models in the fall and appears to be still gaining momentum.

And, as the Macintosh slides toward commoditization, it's clear that Apple's retaining its innovative edge, with Newton (the first of the Apple Personal Digital Assistants, one of Sculley's favorite projects) due in early '93 and various breakthroughs in such technologies as multimedia and wireless networking waiting in the wings.

And, while the alliances with IBM (resulting in the formation of Taligent and Kaleida) and Microsoft (resulting in Apple's active support of the Windows platform) are probably the most startling in historic terms, Sculley has also formed joint-development pacts with companies including Sony, Toshiba, and Sharp Electronics, moving ever-further from Apple's former emphasis on closed, proprietary architectures.

Sculley appears to have a clear vision of the industry's multifaceted future and Apple's role in it. He recently told *Forbes* ASAP's Rich Karlgaard: "What Apple can bring is a human-centric view of the world. There is no company other than Apple that is more passionate about making technology accessible, and even invisible, to people so that they can do things with it and not have to get caught up in the expert jargon. Can we put those two ideas together—a human-centric passion along with a revolution in digital communications? That's really the vision I'm driving at Apple."

Jonathan Seybold

President

Seybold Seminars

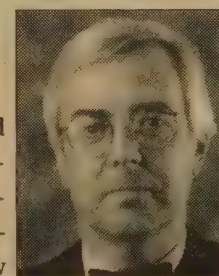
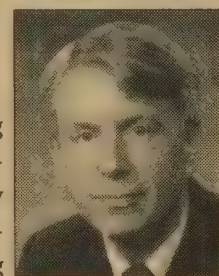
One of the industry's leading and most intelligent catalyzing forces, Seybold has a way of bringing people and technology together in interesting and useful ways. His conferences provide an indispensable forum for publishing and multimedia vendors to showcase their wares, and for professionals and their clients to grapple with the problems and opportunities that emerge as everything becomes digital.

Richard A. Shaffer

Founder and Principal

Technologic Partners

For the entrepreneurial and investment community, Shaffer's conferences and publications (which include the *ComputerLetter* and brand-new



VentureFinance newsletters) and a column in *Forbes*, provide a unique and indispensable information resource. He offers insightful, thoroughly researched analysis of industry trends, emerging markets, and how shrewd investors and companies can transform them into opportunities.

Roger Sippl

Chairman

Phillip White

President and CEO

Informix

Sippl and White have faced some formidable challenges in recent years, positioning their company and its technology to address the rapidly changing nature of data-handling needs. However, 1992 found their efforts paying off and their product line's sophisticated capabilities edging out the competition for a number of lucrative government contracts. While garnering record-breaking earnings during 1992, Sippl and White also expanded the company's global operations significantly, particularly in Mexico and South America where Informix is finding enthusiastic acceptance in government and corporate installations.

Michael Slater

Editor and Publisher

Microprocessor Report

SPARC? MIPS? Intel? Cyrix? AMD? Alpha? Hobbit? With a bewildering array of CPU standards and variants arriving on the scene, the technical community has a compelling need for in-depth information on the current state of silicon. Slater's newsletter and annual conference have become vital resources for getting this information to the people who need it.

Michael Solomon

President and Co-CEO

Light Source

In this Larkspur-based startup, Solomon leads a small group of multimedia experts in creating some genuinely revolutionary technology. The company's first product, Ofoto, was initially bundled with Apple scanners in the Mac and Windows markets, and then shipped as a standalone product. To those accustomed to the dubious results produced by scanning photos with earlier technology, Ofoto's ability to deliver faithful, high-quality reproduction is little short of life-changing. The product has brought professional-quality output within the economic reach of most users and promises to make those usually hideous LaserWriter approximations of halftones a thing of the past.

Robert D. Steele

President

Open Source Solutions

Steele, a veteran of the Marines and government intelligence organizations, founded the nonprofit Open Source Solutions, saying, "Never before has the intelligence community focused so directly on the need to take greater advantage of commercial information services. It is my belief that a new relationship between government and the private sector's information brokers is going to emerge as a positive outcome of our current fiscal crisis."



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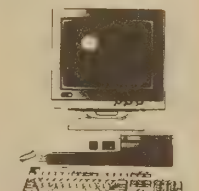
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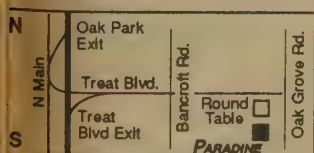
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In December the organization put on the first symposium on National Security and National Competitiveness: Open Source Solutions. In the course of the three-day conference, presentations ranged from Dr. James Holden-Rhodes of Los Alamos on "Divining Secrets: Open Source Intelligence in the War on Drugs" to Jane's Information Group on "An Information Vendor's Perspective on the Changing Information Environment and Opportunities for Government-Private Sector Cooperation" to John Perry Barlow on "EFF and the National Public Network."

Bruce Sterling

Author

The Hacker Crackdown

"Early on, it seemed possible—maybe even likely—that the crackdown could successfully combine the best of both worlds. The arrest of hackers would be heavily publicized. The actual deeds of the hackers, which were technically hard to explain and also a security risk, would be left decently obscured. The threat hackers posed would be heavily trumpeted; the likelihood of their actually committing such fearsome crimes would be left to the public's imagination. The spread of the computer underground, and its growing technical sophistication, would be heavily promoted; the actual hackers themselves, mostly bespectacled, middle-class, white, suburban teenagers, would be denied any personal publicity.

"It does not seem to have occurred to any telco official that the hackers accused would demand a day in court; that journalists would smile upon the hackers as 'good copy'; that wealthy high-tech entrepreneurs would offer moral and financial support to crackdown victims; that constitutional lawyers would show up with briefcases, frowning mightily. This possibility does not seem to have ever entered the game plan."

So writes science fiction author Sterling, who was diverted from his usual pursuits into researching and chronicling the often-bizarre clash in 1990 between law enforcement and the telephone companies on the one hand and the computer underground on the other. The immediate impetus for his concern was the fear that if neighbor and game publisher Steve Jackson could have his business shut down and his equipment confiscated, apparently for the "crime" of publishing cyberpunk fiction, cyberpunk author Sterling might be next.

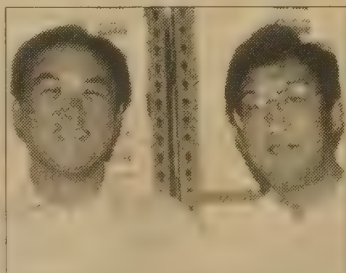
The reality, of course, turned out to be considerably more complex, and this well-researched account of such matters as the notorious E911 document, Operation Sun Devil, and the creation of the Electronic Frontier Foundation is an indispensable resource to anyone trying to make sense of the legal and social issues of the online world.

David Sun John Tu

Cofounders

Kingston Technology

Topping this year's *Inc.* 500 list of fastest-growing privately held



companies in the US, the company Sun and Tu founded in 1987 to take advantage of the impend-

ing increase in demand for memory owes its success (and phenomenal productivity of \$1.8 million per employee) to more than the sudden demand for RAM-hungry graphical interfaces.

The Fountain Valley company exemplifies the emerging trend toward flattened hierarchies, just-in-time inventories, fanatical quality control (Kingston tests 100% of its product before shipping), and rapid adjustment to changing markets with new innovations. The result, according to *Inc.*, is a 45% market share and a growth rate of 117,000%. The rest of the industry could learn a thing or two from these guys...

Edward D. Thomas

President

Hyundai Information Systems

Clones from Korea are nothing new. A Korean vendor moving its entire PC operation to San Jose, on the other hand...

Since Hyundai announced this dramatic move of everything from PC product development to manufacturing to California, Thomas has worked aggressively to position the extensive PC product line against its entrenched competitors in the high- and low-end markets. Strategic alliances with Microsoft, Novell, and Intel, and marketing channels from direct sales and support to Bizmart, have made Hyundai a contender in the marketplace while creating new jobs in the midst of a recession.

Bill Tobin

Cofounder

PC Flowers

In 1989, entrepreneur Tobin took a look at the online marketing capabilities offered by Prodigy and other services and decided that this was the perfect way to sell flowers. The leading flowers-by-wire service, FTD, was initially resistant to the notion, but in 1990 PC Flowers debuted on Prodigy as the 25,000th-ranked among FTD's 25,000 members. With a current presence not only on Prodigy but on RBOC gateways nationwide, PC Flowers is now the #2 FTD member in the country, and plans to expand into Interactive Cable TV in 1993.



Deborah Triant

President and CEO

Sitka

The advent of System 7 may have essentially eliminated the need of Mac networks for TOPS, but Sitka has continued to innovate technologically. Its PenTOPS client and PenCentral server software enable EO's revolutionary Personal Communicators to connect with drives, printers, and gateways to Novell and LAN Manager networks.

Another of Sitka's radical moves in 1992 had nothing to do with technology per se, but with solving the problems related to marketing network products through the dealer channel. Historically, while customers may buy their initial setup from their local dealer or VAR, they are quite likely to buy elsewhere when it comes time to expand, often going to direct sales or mail order. This, in turn, is a profound disincentive for the dealer to carry and support the product line in the first place.



Sitka cleverly addressed this situation with its Customer for Life program. When a customer decides to expand the network, Sitka's proprietary expansion and serialization technology allows the addition of more nodes directly over the phone. And at that time, the originating dealer and distributor receive commissions directly from Sitka.

As Triant said at the April announcement, "Every reseller has experienced the frustration of spending weeks or months selling the benefits of a network solution, only to watch the customer purchase from a different dealer who cut the price by 10%. The Customer for Life program ends that frustration. It substantially improves reseller profit margins and guarantees that the reseller who provides the customer with the initial network reaps the incremental profit as that network grows."

Ted Waitt

President and CEO

Gateway 2000

When Waitt and cofounder Mike Hammond (now vice president of product development) started Gateway 2000 in 1985, their first business involved selling system enhancement products to owners of orphaned Texas Instruments machines. This was a surprisingly lucrative endeavor, but they realized (not unlike enterprising Texas student Michael Dell) that the future was in mail-order, custom-configured PC compatibles. According to a recent survey by IDC, Gateway has surpassed all other brands in PC market share—it has 3.6% of the PC market, compared to Compaq's 3.5% and Dell's 2.1%.

While other PC hardware vendors have suffered in recent recessionary years, Gateway just achieves new levels of prosperity—it was #1 on the 1991 *Inc.* 500 list of fastest-growing private companies, and #2 in 1992. Waitt attributes this success to the company's ability to buy high-quality components at attractive prices because of its volume: "We buy the best components in large volumes and pass these savings on to our customers. Our pricing structure is based on prices we receive for components, not market factors. Therefore, we offer lower prices and sell thousands of systems, which enables us to buy more components in larger volumes at even lower prices."

All in all, it's been a boon to the economy of South Dakota, not a traditional hotbed of high-tech.

John Walker

Programmer

Autodesk

In a sense, Walker's now-fabled Information Letter #14, "Autodesk: The Final Days" and its galvanizing effect on the company he cofounded epitomize the current trends toward quickly responsive, non-hierarchical corporate management. Increasingly concerned with the ascendancy of the bean-counters and the encroaching sense of complacency of the company, he launched the letter in the company email and achieved a dramatic turnaround, culminating in the arrival of new CEO Carol Bartz.

Not long after our May interview with Walker ran, we received some email from a longtime Autodesk employee about the situation.

"How a company can go very, very bad very, very quickly is nothing new," he said. "We've all seen it before. But a company turning it around and

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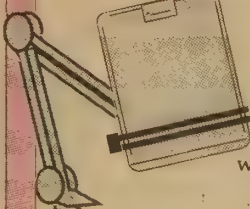
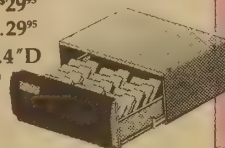
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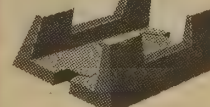
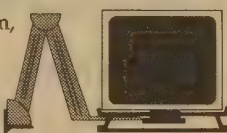
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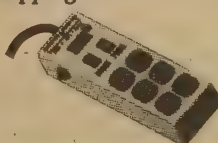
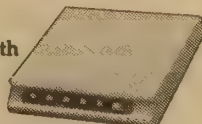


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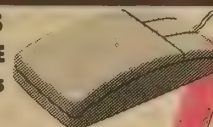
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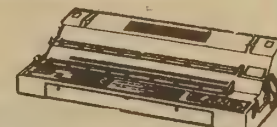
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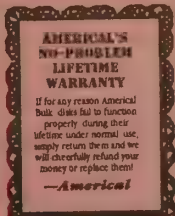
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regaining its soul, well, I can't think of any example offhand. I always expected Autodesk to turn to shit—all companies do, no big story there—but I certainly never expected it to turn around."

Judge Vaughn Walker

US District Court

Walker, the judge in charge of the notorious Apple/Microsoft look-and-feel suit, caused a flurry of dubious and self-serving pronouncements from both companies when he drastically narrowed the scope of issues to be considered in the suit, discarding most of Apple's broader claims. In general he has shown a depth of understanding of the technical issues that's somewhat unusual in the legal community, and it appears that his impending decision on the remaining issues will rest on a well-reasoned foundation.

D. Bruce Walter

President

GRID

Pen-based computing is nothing new to GRiD, which has been successfully selling handwriting-based systems to vertical-market clients for years. However, its introduction of the GRiD Convertible in 1992 marked a strong entry into the horizontal market. It's a lightweight notebook-sized computer, which accepts handwritten input on its screen and includes a conventional keyboard for running DOS and Windows applications. Unlike the ill-fated Momenta, which pioneered this concept last year, the Convertible is compact and easy to carry around, and, rumor has it, already being copied extensively by many notebook-computer vendors.

John Warnock

Chairman and CEO

Adobe

While there's been quite a proliferation of font technology over the last few years, all of it trying to compete with Adobe's PostScript, Warnock's enjoyed the vindication of seeing PostScript adopted as a standard by more and more vendors, including many who originally thought they could do without it or make do with a clone—recent converts include Sun, which is including Display PostScript (first introduced on the NeXT platform) as part of the Solaris operating system.

And Adobe's PostScript-based graphics products are on the move to a number of new operating platforms—long available only on the Macintosh, Photoshop will have Windows, Silicon Graphics, and Sun versions in the near future.

But Warnock isn't resting complacently on existing products—due in early 1993 are the first shipments of the long-awaited Adobe Acrobat (formerly Carousel), a technology intended to let users handle and exchange documents (fax, sound, graphics, video, etc.) over diverse hardware platforms and software applications.

Jim Warren

Columnist

Maybe it's just the election year, but we've received quite a bit of positive feedback this year about Warren's columns and other efforts to bring about

improved access to computerized public records, an important tool as "electronic democracy" becomes a buzzword. We agree that Jim's doing vitally important work in restoring public power to its proper owners; we'd like to add this salute to the chorus and encourage him to keep up the good work.

Ken Wasch

Executive Director

Software Publishers Association

Whatever you may think of the SPA's zealous "Software Police" approach to copyright enforcement ("One call to the Piracy Hotline is all it takes for the 'Software Police' to come knocking at your computers," a recent Associated Press article began), there is little doubt that Wasch is doing an extremely effective job of representing the interests of member organizations.

The SPA's stick-and-carrot approach to combating software piracy ranges from a self-auditing program and consciousness-raising videos to the enactment of legislation forbidding commercial software libraries and, most recently, imposing prison terms of up to five years and fines up to \$250,000 for making ten illicit copies of a program or copying more than \$2500 worth of software.

But in other legislative efforts, the SPA was able to persuade the Feds to relax export restrictions on products incorporating RSA's encryption technology, allowing US software vendors to compete against foreign companies already using the technology.

Maurice Weitman

General Manager

The WELL

After a long search, longtime WELL denizen Weitman was selected to take over the reins from departing director Cliff Figallo, who has since moved on to EFF's Massachusetts headquarters. With an intrepid staff, Weitman keeps things running on Whole Earth's renowned and unique conferencing system, which took on a whole new dimension in 1992 with the addition of Internet access, resulting in an influx of new and interesting users from sites all over the world.

Ken and Roberta Williams

Chairman, President, and CEO/Member, Board of Directors

Sierra On-Line

An enthusiastic reader wrote to sing the praises of author Roberta Williams for the latest release in the perennial King's Quest series, Heir Today, Gone Tomorrow. Indeed, most of Sierra's product line garners both critical acclaim and enviable sales, from children's software to the escapades of the ever-popular slimeball Leisure Suit Larry.

One of the few computer game houses that's prospered over the industry changes of the last decade, Sierra On-Line is far from complacent—among its recent innovations, reflecting the impact of telecommunications on the computing industry of late, is The Sierra Network, a low-cost online



gaming network that lets geographically distant subscribers play computer games with each other. "Just as the introduction of television revolutionized home entertainment, and the telephone put faraway friends and loved ones just a finger's walk away, TSN is opening up a whole new world of interactive entertainment, social interaction, and good old-fashioned fun to computer owners," says Ken Williams.

When fiber to the home gets here, Sierra On-Line seems to have a few ideas about what to do with it.

Allen Yu

Chairperson

UNSC Investment Group

Successful clone-industry entrepreneur and former NBI president Yu was instrumental in forming this organization for the purpose of creating CompuExpo, a new international trade show specifically aimed at the PC clone community, whose members often felt either lost at COMDEX or excluded by the high price of exhibiting there. The first show was held in Las Vegas in September and the 1993 event already has commitments from US and offshore vendors including IBM itself.

Says Yu, "We are committed to delivering a high-quality, low-cost, partnership-building trade show to our exhibitors and attendees for the long term. We are committed to holding an international show in Las Vegas on an annual basis, and we will continue to carry the message that a profitable, industry-wide alternative exists to other trade shows. We encourage all customer-driven, competitive companies to join with us in building the Second Ten Years of the PC Industry."

Ed Zander

President

SunSoft

A key element in Sun's continuing success and expansion into the PC power-user marketplace, Zander's been very effective at delivering new versions of the Solaris operating system, a key component in the strategy. As a shrewd move to make the Sun platform an attractive option to current Intel users, SunSoft has shipped an Intel-based version as well as a SPARC-based version of Solaris, allowing disparate machines to work together or separately.

Pierluigi Zappacosta

President and CEO

Logitech

From a small software startup ten years ago, cofounder Zappacosta has made Logitech the premier source worldwide for computer-humanizing devices from mice to digital cameras. In addition to introducing a host of market-developing innovations under its own label (including ScanMan scanners, FotoMan cameras, a full range of ergonomic mice and more), Logitech provides OEM components to hardware vendors around the globe, including Apple, Acer, Compaq, and Hewlett-Packard. And, when pen-based computing arrives, Logitech will be there—it was recently chosen as the supplier of digitizing technology for GRiD's palm-pad computer. ■

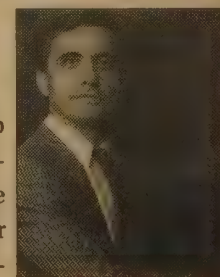
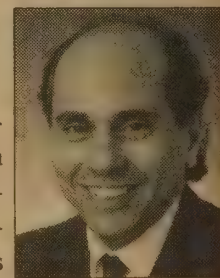


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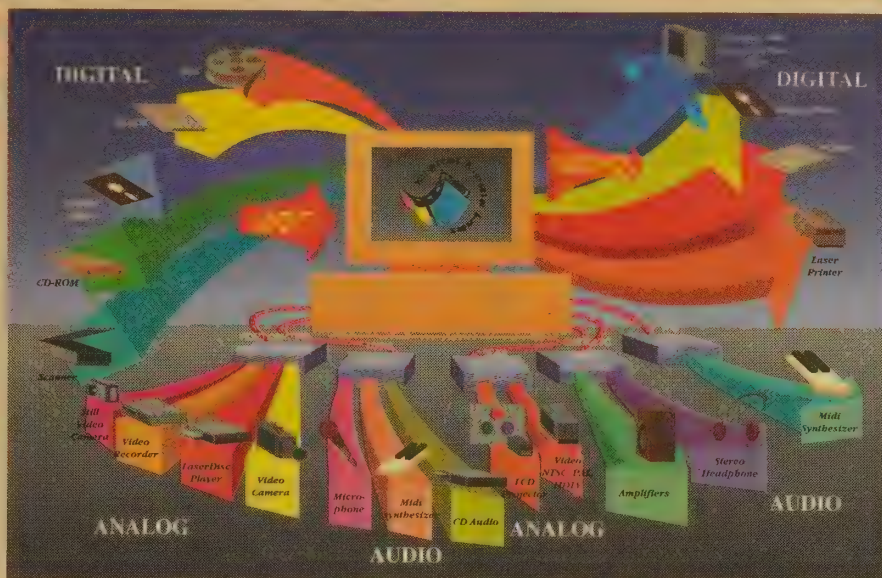
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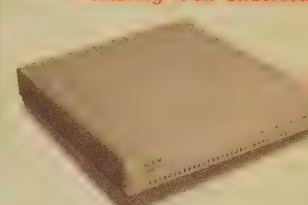


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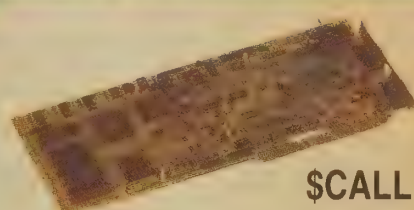
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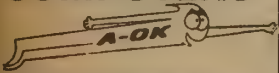
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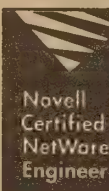
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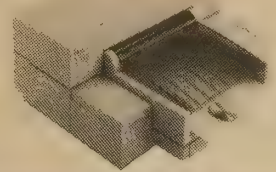
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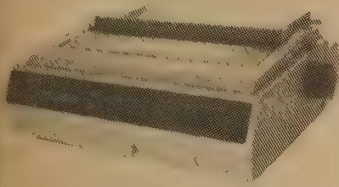


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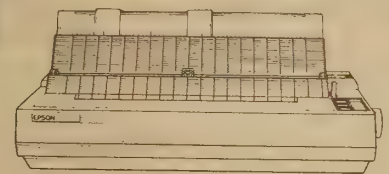
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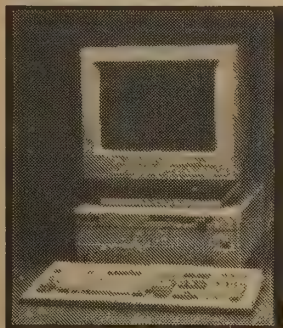
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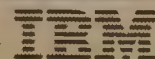
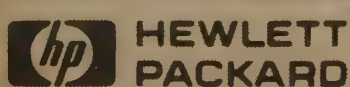
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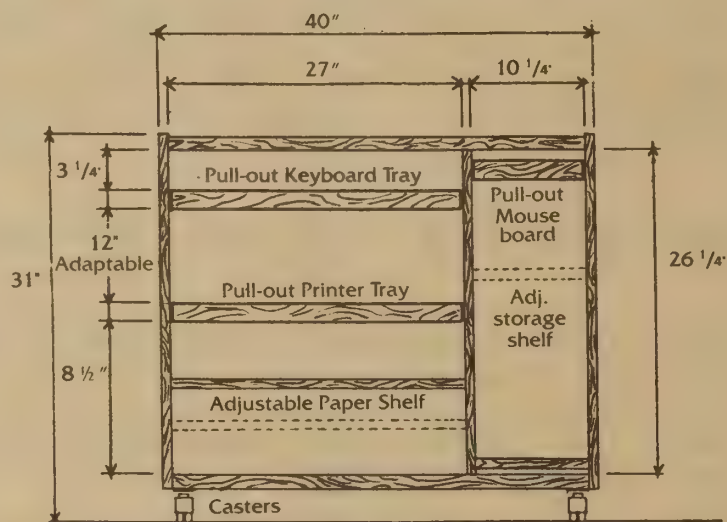


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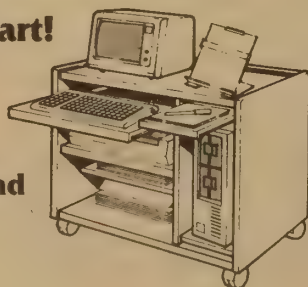
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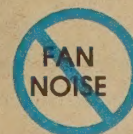
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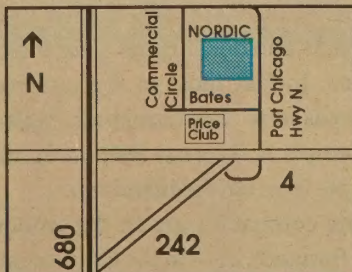
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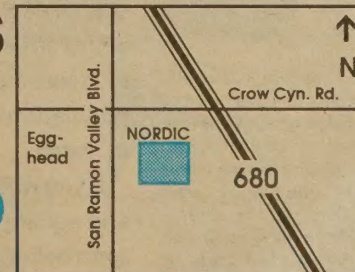


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Developing A New Theory Of The Universe

Or, Closer To Home, Cow Chips And Technology

BY JOHN C. DVORAK

The Silicon Valley of the Northeast lies along a corridor called Route 128—a thoroughway through Massachusetts. Of all the Silicon Valleys in the country Route 128 is probably the duller and most boring—especially in winter when it's drab and brown.

That's what I always thought until I started to look at the other pockets of high-tech activity. They are all dull and boring. Worse, they reflect an agrarian mentality that seems archaic in today's age.

Even the name "Silicon Valley" has a farm-tinging to it. Curiously, there is no real Silicon Valley in Santa Clara. There are various industrial parks here and there that have excessive numbers of high-tech firms, but there is no concentration that would resemble anything like, say, the garment district of New

On the other hand, we have two of the early conceptualizers of modern clone marketing in Minnesota. Minnesota's starter crystal was Control Data, from which Cray emerged. The two clone makers are Northgate and ZEOS. Both companies make credible machines, and both have led technologically in one category or another. Still, Northgate had severe financial problems and ZEOS has been rethinking strategies.

Meanwhile, back down in Texas, nobody can tell me what the differences are between the machines made in Texas and those made in Minnesota. The Texans are kicking butt. The variable is actually not related to the machines but to the infrastructure, the people, and the inexplicable. Maybe it's the weather. Take Control Data (please!): Why

did it become such a dud of a company?

And in Sioux Falls, South Dakota, Gate-

way 2000 is doing very well and it is itself the starter crystal.

This is all too much like the game of LIFE, one aspect of which is that you seed an area and see what happens. Where is the planning? There is no planning. It's all a matter of luck. It's just like incompetent farming.

Here's where the geographic aspects of high tech get interesting. If we look at it from a different perspective. Preindustrial, low-tech farming.

On the surface, this just looks like decentralization as the more aggressive companies move out of the big cities and into more rural environments. It's not. It's a return to the farm, as it were, only the farm is being turned into an industrial park. In the Santa Clara Valley and around Fremont, some of the world's greatest farmland was turned into industrial parks and housing tracts for high-tech workers. In fact most of the modern high-tech areas were once farmlands. Again, the best example is Gateway 2000 in South Dakota. Apple is on old farmland too.

Now some companies are in the woods (Microsoft, Borland), a few in the city (Lotus). Note, though, that most high-tech firms are spread all over the place. There is nothing like the steel mills of the Ruhr valley in Germany. High tech is in San Diego, Phoenix, New

Hampshire, and Baton Rouge. In fact, it's ridiculous. The decentralization of American business to the extent that high tech is decentralized is ludicrous. It makes no sense. There are too many pockets of activity. While decentralization is good to a point, there has to be a limit. The only beneficiaries of this are the delivery systems operators.

I've always felt that the high-tech business

It's a return to the farm, as it were, only the farm is being turned into an industrial park.

was reminiscent of the farming community. There is a lot of back fence chit-chat, and the companies exchange workers as though they were farm hands. Itinerant farm hands, in many cases. The fact that most of these companies actually located themselves on abandoned farmland is further evidence of the connection and the mentality.

While it's interesting, the fact is that the computer business is not farming. When you see the grand structures built by the industrialists of the last century and compare them to the industrial park of today you have to wonder: Where is the progress? Today's "campus"—no matter where it is located—is more sterile and depressing than the worst New England mill.

I have no suggestions on how to reverse this trend. I can't prove that it's bad. I can't figure out how the business can be centralized and made more efficient. All I can do is make the observation that these farmland pockets of activity are ridiculous. ■

DVORAK'S LAST COLUMN

York City.

Hubs of activity permeate the country, usually cropping up where some old-time high-tech firm once dominated the local scene. In and around Beaverton, where Tektronix grew up, there is a slug of little spinoffs. Around Boeing in Seattle, there is Microsoft and Nintendo and a lot of engineering and software companies. Around Hewlett-Packard in Palo Alto formed the loose association called Silicon Valley. In Maynard there is Digital.

This phenomenon of dispersion has always fascinated me because it reminds me of that old computer game, LIFE. You throw a group of organisms into a spot, and they reproduce and grow and die and fight and shrink and grow and, if you're lucky, stabilize. This is supposed to represent a population. It starts with a critical mass and grows. If the attempt to create a critical mass falls short, the little population dies fast. It's the damndest thing to watch.

If you watch the game of LIFE long enough and equate it with the computer scene, you soon believe that the mathematics are more important than the products. Look at the clone makers. The mass of them in Texas, and especially around Austin, has made them all thrive.



© 1993 by John C. Dvorak. All rights reserved. John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine and MacUser, and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.

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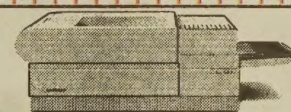
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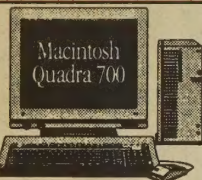


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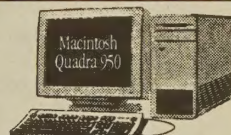
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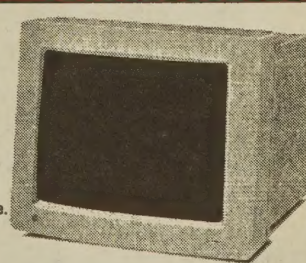
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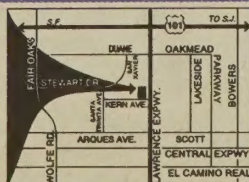
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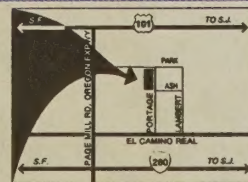


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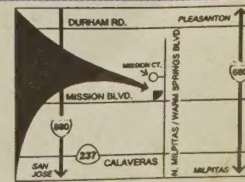
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